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	PAGE		PAGE
Agencies — Clay Products	II	Brick Enameled	III and IV
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" Terra Cotta	II and III	Fireproofing	IV
Brick	III	Roofing Tile	IV

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CONTENTS

PLATE ILLUSTRATIONS

FROM WORK BY

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LETTERPRESS

PAGE

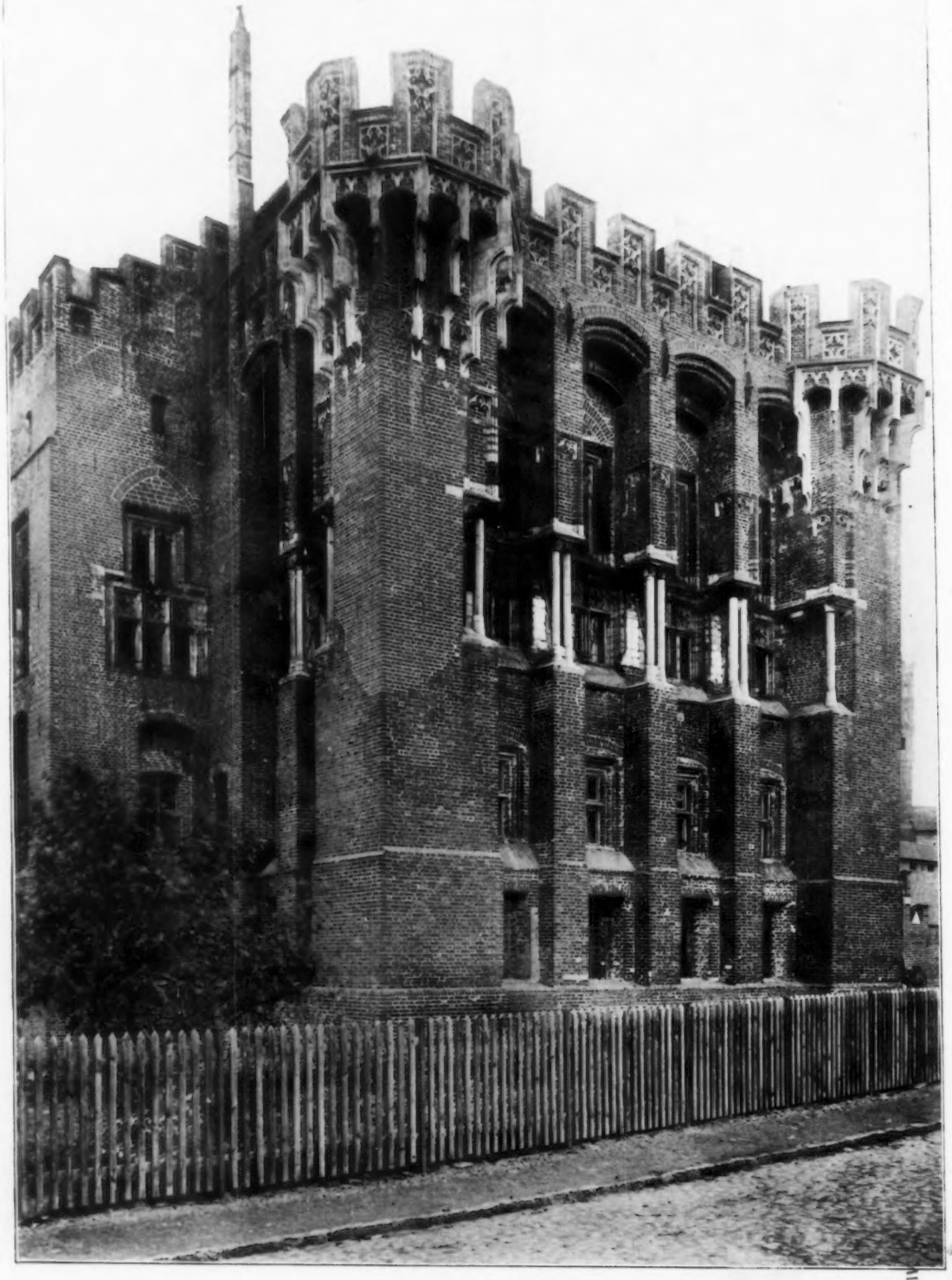
THE CASTLE, MARIENBURG, PRUSSIA ..... Frontispiece

THE AMERICAN THEATER — VII ..... *Clarence H. Blackall* 111

THE PUBLIC BATH — V ..... *Harold Werner and August P. Windolph* 115

ARMORIES FOR THE ORGANIZED MILITIA — I ..... *Lieut.-Col. J. Hollis Wells* 120

EDITORIAL COMMENT AND MISCELLANY 128



THE CASTLE, MARIENBURG, PRUSSIA.

THE BRICKBVILDER

VOL. 17 NO. 6 — DEVOTED·TO·THE·INTERESTS·OF·ARCHITECTVRE·IN·MATERIALS·OF·CLAY· — JUNE 1908

The American Theater — VII.

SAFETY FROM FIRE.

BY CLARENCE H. BLACKALL.

THE greatest source of danger in every theater fire has been not in the fire nor in the smoke but in the people themselves, who lose their heads and trample one another to death. Accordingly, the first consideration of safety is that the exits shall be of such arrangement and size that a panic-stricken crowd cannot go wrong. It is, of course, impossible to make any building panic proof, but there are certainly many things to avoid in the construction of an auditorium, and there are some constructions which should enter into the planning of every public hall.

Most of our cities now require open courts or streets on each side of the auditorium of a theater. The required width of these courts varies from six feet in Boston to ten feet in Rochester, and it is everywhere required that they shall connect without interruption to a public thoroughfare. This is a regulation which sometimes seems like a hardship to the owner who is required to give up a large portion of the available width of his lot, but it is a very desirable provision and one that ought not to be slighted. We have not yet in this country come to the point of obliging every theater to be open to the streets on all sides, as is the case in most European cities, though that is by far the best arrangement.

As has previously been stated in this series, Boston is one of the few cities in which the Building Law is exigent as regards lobbies. The theory is that in case of fire the audience should have a lobby of sufficient size to accommodate the entire audience standing. The real efficiency of this arrangement has never been put to a test. It is extremely doubtful if theaters that have large lobbies would be any safer than those which have no lobbies at all but have properly arranged exit corridors. On the other hand, there is no controverting the advantage of lobbies from the point of view of convenience. They are never built in this country too large for that purpose, and they are often reduced in size to the vanishing point; but as a matter of mere safety, in case of a fire or panic, it is not conceivable that the audience will rush into the lobbies and stay there while the theater burns, and the real value of a lobby as part of a safety exit is measured by the capacity of the exits leading from this lobby to the street. The mere interposition of what might be termed an expansion joint into the line of exits would not make the danger materially less in case of panic. This principle should be borne in mind in planning exit corridors, especially those from the galleries. It is a good scheme to start with these of the maximum size which shall be determined upon and to continue this size practically unbroken to the street. If expanded into lobbies, or if they have any marked projections, these passages might easily become danger spots for a panic-stricken crowd.

Furthermore, when flights of stairs form a part of a line of exits, these stairs should be kept as nearly uniform in rise and tread as possible. Any variation in one or the other is very apt to cause a crowd to stumble. Also, in such lines of exits all interior corners should be rounded out so that by no possibility could individuals be caught in an eddy and crushed. Some of these precautions may seem unnecessary, but sad experiences have shown how unreasonable a crowd will be.

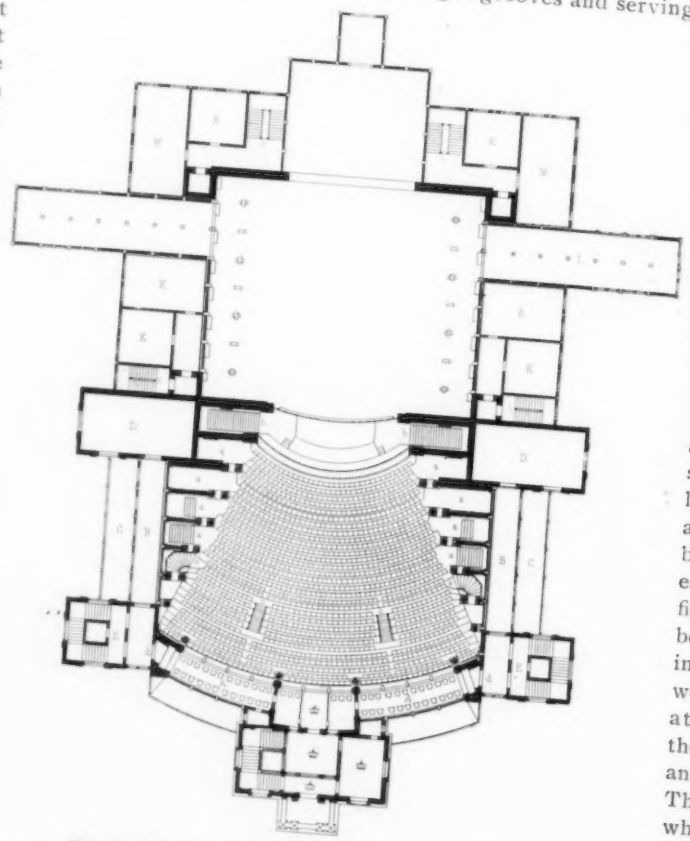
Dependence should not be put upon so-called emergency exits. A crowd will go in the usual lines and cannot be depended upon to avail themselves of any exits not ordinarily in use. For this reason so-called exterior fire escapes are of little practical value in case of panic. While, of course, they are a great deal better than nothing, and may sometimes save lives in case of fire after the first rush, the right way is to make the regular exits ample, and have them used every time the theater is emptied, so that the public may become accustomed to such ways of egress. Exterior fire escapes suggest safety; as a matter of fact, they are seldom constructed so as to be of use. In some cities it is required that such exterior exits shall be covered to protect them from snow and ice, and the rise and tread of the stairs is usually prescribed by law; but they are, after all, unusual exits, and are generally steep and dangerous in appearance. The interior exit is really safer for fire and panic.

Two lines of exit should not converge so as to create a congestion, and a flight of stairs should never end in a corridor serving as an exit from another section of the house unless the stairs end at a distance equal their own width from the cross corridor. Also, where space will permit, two separate stairways, each five or six feet wide, will serve to better purpose than a single stairway of the combined width of the two, and where it is absolutely

necessary to have a single wide stairway any width over six feet should be provided with a strong center rail.

Inside of the auditorium itself care should be taken that the exits from the balcony and gallery shall never be downward but up toward the rear, and there should never be steps down where two lines of exits converge. This was a condition which existed at the Iroquois Theater at the time of the fire, and which led to a great loss of lives by reason of the people stumbling and being buried in heaps about a doorway. For similar reason vomitories are not desirable. There are many cases where they have been employed, but in the ideal theater all the exits would be out from the rear, and it is not possible to so construct vomitories that there could not be very serious congestion at the exits in case of a panic.

The various theater fires which have so shocked the communities within the last few years have, notwithstanding their disastrous results, demonstrated, without question, that from a structural standpoint a building can be made fireproof. The difficulty always is with the fittings and furnishings. They are of necessity more or less inflammable, and no satisfactory device has yet been worked out to fireproof fabrics without a sacrifice of their artistic value. But all the fabrics and wood finish in a modern fireproof theater would never bring death to an audience so long as the individuals kept their head. It is only when the exits are blocked by unreasonable crowds that those behind are scorched by the flames from the draperies and woodwork.



FLOOR PLAN, WAGNER OPERA HOUSE, BEYREUTH.

For Distinguished Strangers.—A. Boxes. B Lounge. C. Balcony. D. Anteroom. E. Staircase. K. Dressing-Room. L. Scene Store. M. Chorus. a. Entrance to Stalls. b. Entrance to Orchestra. c. Service Stairs. d. Entrance to Distinguished Strangers' Boxes.

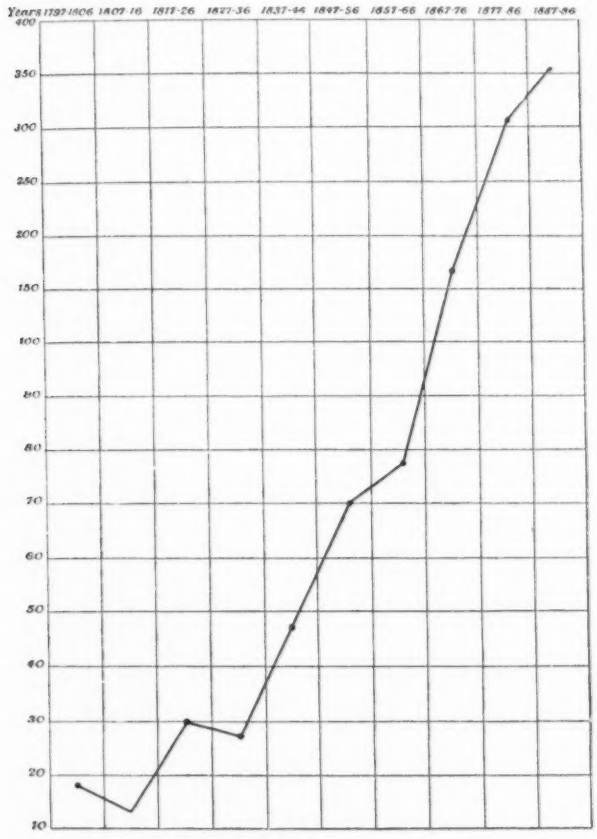
A theater fire usually starts on the stage, and every city has regulations requiring some form of fire curtain intended to confine the flames and at least a part of the smoke to the stage. The much vaunted asbestos curtain is sometimes a snare and delusion by not working properly, or by working at the wrong time, but if in proper order and running easily in metal grooves, it will serve as a fairly efficient barrier against flames. Unfortunately, when an asbestos curtain shuts down on a stage fire the conditions behind the curtain are made worse and the actors are lucky if they get out alive. As the stage hands are usually the first to discover the fire, and as exit is far easier for them than for the audience, it is by no means sure that the fire curtain will close except by the parting of the fusible links which hold it open, for it is asking too much of ordinary human nature to expect that stage hands would always sacrifice themselves to give a few moments respite to a panicky audience. As a matter of fact, no asbestos curtain has ever been of much practical value except in the case of a slight conflagration on the stage.

The asbestos curtain is very little used in Europe, its place being taken by a screen consisting of a steel framework covered with corrugated iron, the whole working in tight grooves and serving as a very efficient fire stop. Its value was demonstrated within a short time at the Drury Lane Theater in London, where a fire on the stage did a great deal of damage to that part of the house without spreading beyond the fire curtain. This form of construction is not required by law in this country and is seldom used, but it is far preferable to asbestos.

Some cities require that a fireproof curtain shall be so marked plainly in letters visible to the entire audience and that it shall be closed before and after each performance. If the fireproof curtain were to be suddenly lowered during an act, the audience would be very apt to jump at the conclusion that there was danger from fire and a panic would ensue. There is no good reason why a fire curtain should not be treated like an ordinary act drop, so far as appearance is concerned, and there does not seem to be anything gained by labeling it as a fireproof curtain. Of course, this fireproof curtain, whether of asbestos or steel, should in every case be automatic in its action, so a sudden rise in temperature over the stage will melt a fusible link and allow the curtain to descend.

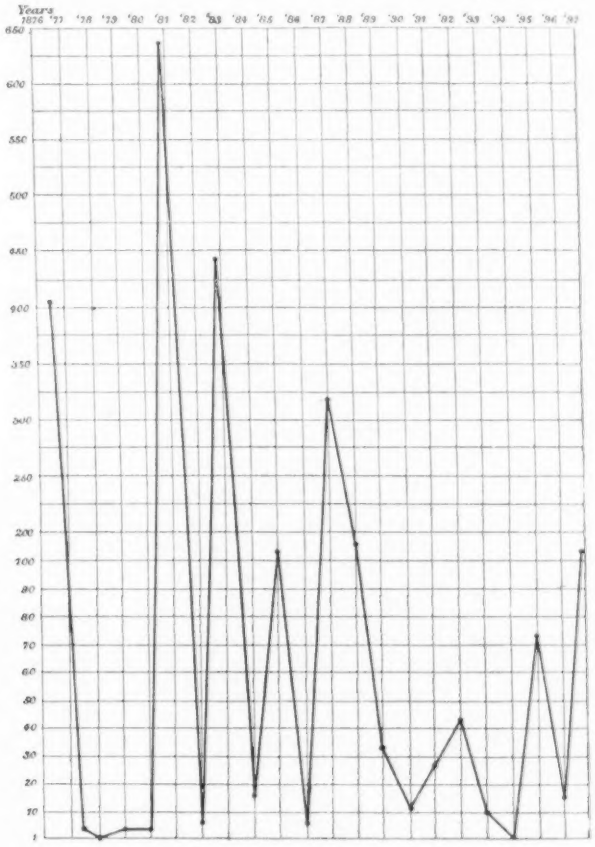
Very few American theaters are so arranged as to safely handle a panic-stricken crowd, and it is quite likely that commercial requirements will always be a bar to even a measure of success in this direction, but to illustrate what might be, there is a very excellent illustration afforded by the theater which Richard Wagner built at Beyreuth, where he had plenty of room and where the mere construction was so cheap that he was free to give all the desired space to exits and accessories. The theater is without balconies or galleries, a single broad and deep

orchestra rising with a regular grade from the stage front, and without aisles or columns or any obstruction. The platforms of the seats are wider than in our average theaters, and each row of seats constitutes an aisle continuous from one side of the building to the other, so that the time required to empty the theater is simply the time required for the people to step out of one row of seats. All these aisles lead to broad, easy foyers outside of the main auditorium, and it is hard to see how even the most panicky crowd could do itself very much damage in this theater as far as relates to the matter of exits. Of course there are many theaters abroad like the Paris Opera House in which the proportion between the



(Number of fires shown at left.)

DIAGRAM SHOWING NUMBER OF THEATER FIRES ACCORDING TO DECADES FROM 1797–1897.



(Number of lives lost shown at left.)

DIAGRAM SHOWING NUMBER OF LIVES LOST IN THEATER FIRES FROM 1876–1897.

exit corridors and the seating capacity of the several divisions of the house is so large that a crowd is dissipated almost instantly it emerges from the few rows of seats served by any one aisle; but we are never able to build our theaters on that liberal scale.

It is usual to surround the curtain opening with some form of water curtain. This consists either of a perforated pipe carried up the sides and across the head, through which a strong stream of water can be thrown if desired; or, perhaps better yet, a fantail jet of large volume is placed midway of each jamb and overhead, so that when turned on these will throw a heavy spray across the entire opening. Then, of course, every theater stage ought to be thoroughly equipped with automatic sprinklers, with automatic fire alarms, and with a standpipe on each side with not less than fifty feet of hose ready for instant use at each level. The use of the English alarm valve on the sprinkler service is not desirable. The writer's experience has been that it will frequently be set ringing by a slight water hammer and in several cases the starting of the gong through no cause except sudden opening or closing of a cock somewhere in the building has started an insipient panic which was not easy to quell. There is one device, however, that should be insisted upon in every theater, and that is some form of automatic skylight above the rigging loft and controlled from the prompter's desk, so that in case of any sudden rise of temperature the skylight will either open entirely by the top revolving or sliding out of place, or else dampers on the sides of a monitor will drop out so as to allow the smoke and flames to escape at once. In the case of the Iroquois Theater it has been stated that the automatic ventilators over the stage were nailed up tight, the flames consequently being driven out from the stage into the audience, causing considerable loss of life. Had these stage ventilators worked properly the course of the flames would have been upward, and, while the panic would probably have been quite as intense, the loss of life from fire would have been greatly reduced. The area of the openings in these skylights should be not less than one-tenth of the floor area of the stage.

The lines which support the scenery over the stage are almost universally in this country of manila rope. As the ordinary stage fitting would include twenty or thirty miles of this rope and as all of the ropes are attached to wooden battens supporting the scenery, it will be appreciated at once that if wire rope could be substituted for the manila and all the battens made throughout of metal, the combustible contents of the stage would be limited to the cloth of the scenery itself. Furthermore, there is no good reason why the scenes themselves should not be constructed of iron. This use of wire rope and metallic frames for scenery is, however, something which has never yet been well worked out and would be practical only when the scenery is operated by power rather than by hand.

Theater fires present some interesting statistics. One would naturally suppose that in the days before so-called fireproof construction, when gas was used exclusively about the stage, the fire hazard would be very great, but the risks seem to have increased faster than the number of theaters. At any rate, the advent of fireproof construction has not materially lessened the loss of life. The two tables which are shown herewith are taken from Sachs' Book on "Modern Opera Houses and Theatres," and show that there has been a constant advance during the last century in the number of fires, while the loss of life, which was at a minimum about 1880, has been steadily increasing. This simply shows that, notwithstanding all our attempts to have our theaters fireproof, we cannot make the audience feel sufficient confidence to avoid a panic. In the celebrated Ring Theater fire at Vienna the loss of life occurred before the performance had begun and when the theater was only partially filled. In the Iroquois fire most of the deaths could have been avoided if the exits had been in proper order and the audience had not become panic-stricken. If every theater were planned simply with a view of securing the very best results for safety to property and to persons the fire hazard would be greatly reduced. The architect is seldom allowed to provide the maximum accommodations in exits, and when he arranges his approaches in what he believes to be the best manner, if he puts in abundant lobbies, ample stairways and easy approaches, the chances are he would be considered extravagant and would not have the chance to design another theater, and as our theaters are controlled by private interests and must earn interest on the investment, we continue to put up each year buildings which we know are not quite right. They come within the law, but none of our theater laws in this country are at all drastic as regards provision for safety. The requirements are whittled down to the utmost minimum to start with, and seldom is a building erected in entire conformity even with these minimum requirements.

THE ATHENEUM, NEW ORLEANS, LA. Stone Btothers, Architects.

The Public Bath — V.

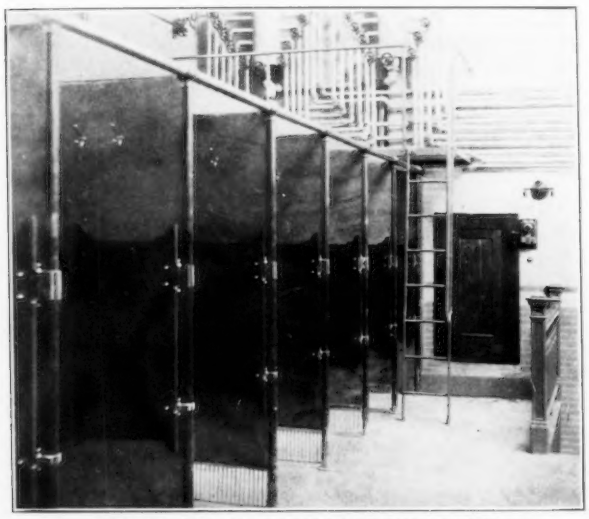
PLAN AND CONSTRUCTION.

BY HAROLD WERNER AND AUGUST P. WINDOLPH.

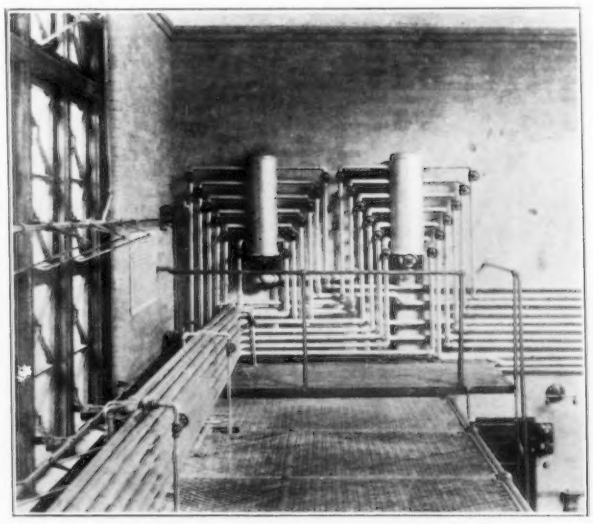
THE ideal public bath building for American cities is essentially a modern problem and must be solved to satisfy exacting and varying conditions. Ancient types are not at all applicable, and while European models offer valuable suggestions for the various forms of bathing and for arrangement of the plant, they are not adaptable as a whole for our purposes

The customary European practice of choosing a site of sufficient dimensions to furnish most of the bathing facilities on one floor is not desirable in this country, where compactness and facility of operation are essentials, because of the fact that our public funds do not permit a large initial expenditure for the acquisition of the site. Here baths are usually located in tenement sections where property is held at a high figure, and they must therefore be economically planned.

The site for the bath should be easily accessible and convenient to a public school; should not be too near a river, particularly if river bathing be available, and, if possible, should be located on a corner, to allow for exits and entrances on two streets, thus separating the sexes. All of these conditions must be carefully weighed in selecting a site. An important matter is the disposition of baths at proper distances from each other, and in the most populous sections it would seem desirable to locate them not more than half a mile apart. A series of small buildings equipped with showers grouped around a larger central building, equipped with a pool as well as showers, would be an effective arrangement. This would differ from the English idea in that the minor establishments would be considerably smaller and the buildings more closely grouped.



SHOWER COMPARTMENTS SHOWING PIPING



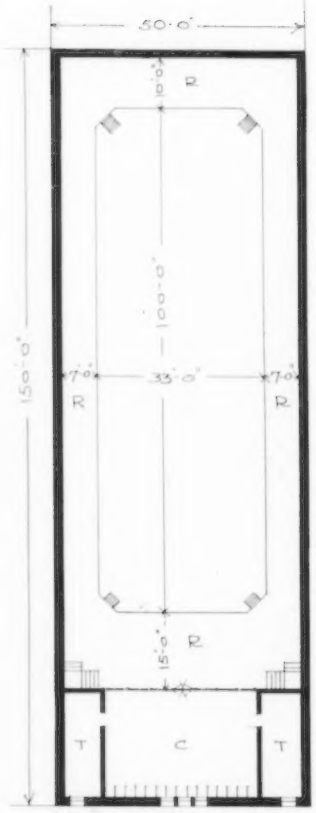
VALVES, PIPING AND WATER DRUMS.

WEST SIXTIETH STREET BATH, NEW YORK.

No public building offers so many difficulties in the matter of selection of site as the public bath. It obviously should be located in the most densely populated section, but such a location does not necessarily imply its success, for the character of the population may change as well as the character of the buildings. Frequently tenement houses are replaced by commercial structures, or there may be an influx of some foreign element which refuses to patronize the institution, and thus handicapped the bath may prove a failure. On the other hand, some of the native-born population have an aversion to the public bath patronized by foreigners. One of the New York City baths is situated on the dividing line between colored and white populations, and the problem of keeping order and superintending the institution is for this reason a most difficult one. While the mission of the bath is to promote homegeneity, it can hardly be expected to solve the race question. If this bath had been placed either in the heart of the white or the colored section, its value to the community would have been greatly enhanced.

The exterior should express the purpose of the building, and while the architect may desire to design an impressive exterior, he must not forget that excess of ornamentation increases the initial cost, and that a pretentious façade repels the poor and defeats the true purposes of the building. The problem is in many ways similar to that of the hospital; fundamentally it must be treated from the standpoint of sanitation, as the mission of the bath is to elevate the standard of cleanliness and public health.

The plan must above all be simple in general arrangement, providing liberal openings for light and air, as the best results are not obtained by use of artificial light or forced ventilation. The work of the institution is greatly facilitated if the corridors are made direct and in easy communication with the entrance halls. Ease of supervision is an important factor. All parts of the building should be accessible, so that if any part of the equipment is damaged it may be quickly located and repaired. There have been several cases where



TYPICAL POOL AND CLEANSING ROOM PLAN.
C. Preliminary Cleansing Room. P. Pool. R. Runway. T. Toilets.

sudden failure in some parts of improperly planned systems have resulted in great damage to the building.

To facilitate the circulation, and to provide for the continuous movement of large crowds in the summer season the waiting rooms should be planned of ample capacity but not to encroach on the bathing hall space. A fair ratio would be about twenty-five per cent of the total ground floor plan, and in case the building has a second story of showers this proportion of waiting-room space should be slightly increased. It is customary to give to the men's waiting room about two and a half times the space allotted to the women, this being the average relative attendance of the sexes.

The staircases should be so arranged in the waiting rooms as to avoid converging lines of bathers and they should be of easy runs and ample width. The superintendent's office is generally placed between the men's and women's waiting rooms, and it should be in instant touch with every part of the building, either through speaking tube or telephone. Occasionally we find the superintendent's office provided with a separate staircase leading directly to the bathing halls above, and it is desirable to provide for direct communication with the boiler rooms below.

In considering the form of bath to be used, what proportion of shower, tub and plunge units should be planned for in order to insure the best results, the problem often becomes very complex. Before proceeding with the planning of the bathing halls and their equipment, it may be well to emphasize the most important factors which make for the ultimate success of the bathing hall — sanitation, economy, popularity. What form of bath best insures these results?

The tub bath has been objected to from the standpoint of sanitation, as it is the most difficult of all fixtures to keep clean, and owing to the space required and the great amount of water consumed can no longer be seriously considered in bath equipment. The principal virtue of the shower bath is its sanitation, — its popularity and economy are in question. The form of angle valve in use to-day in shower compartments does not control the water consumption, and as the valves are under the bather's own control they are frequently left open, causing considerable loss of water. There are sometimes bad cases of scalding in the compartments, and another objection is the difficulty of properly supervising a large number of bathers who crowd in the compartments and thus destroy its principal virtue, the isolated bath.

Any form of bath must be popular and the shower lacks popularity with the masses. Of all the baths the pool best combines sanitation, economy and popularity. Up to very recently the pool bath has not been truly sanitary, but there is no reason why, with proper devices, the pool may not be made absolutely safe. In England the authorities maintain that if the pool is sufficiently large and properly replenished it is an ideal form of bath.

London has over sixty public baths equipped with pools, furnishing accommodations annually for millions of bathers, and the death rate has shown a considerable decrease in the last two decades, the time that most of these baths have been in operation. Just what part the pool is a factor in the general public health would be difficult to determine, but the consensus of English opinion is that a pool properly constructed should be incorporated in every bath house.

As to its economic value, the initial cost of the pool is less than any other form of bath, — furthermore, the water consumption, being under absolute control of the superintendent, is much less than in other forms of bathing.

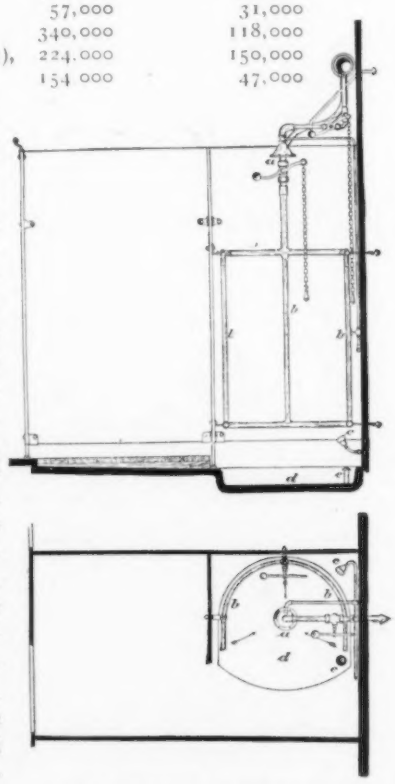
It requires less supervision and also costs less to maintain, as the waste lines and fittings are considerably simplified.

The popularity of the pool bath has never been questioned. According to a table recently compiled in England, the attendance for one year in the various forms of bath is as follows:

	Pool.	All other baths.
Birmingham,	302,000	126,000
Coventry,	57,000	31,000
Liverpool,	340,000	118,000
London (Islington),	224.000	150,000
Salford,	154 000	47,000

In this country a recent test in a public bath showed a ratio of three pool bathers to one shower bather, but what is still more significant is the fact that on certain days, when the plunge bath was not in operation, the bath house was practically without patrons.

A most interesting and gratifying sight is to visit one of the London public baths on the day of a swimming competition, where the pick of the swimmers of rival districts and their numerous adherents, many of whom have also earnestly trained for these events, enthusiastically cheer their fellow swimmers



PLAN AND SECTION OF SHOWER COMPARTMENT, FOREIGN BATH.

in friendly competition. Such a facility cannot fail to promote manliness as well as to elevate the general health and moral tone of the community. The pool will be a valuable auxiliary to modern public school education when the art of swimming is included in the curriculum.

In proportioning the bath units it is evident that the pool should have the greatest number with the shower baths as auxiliary, in ratio of three to two, and on a basis of a hundred bath units the ratio would be as follows:

Pool,	60
Men's showers,	26
Women's showers,	12
Toilets,	2

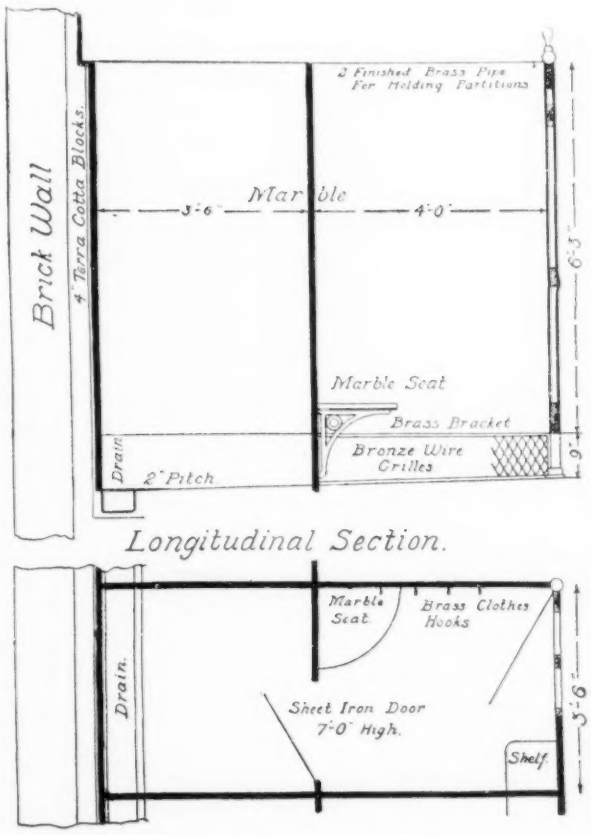
SHOWER HALL, WEST SIXTIETH STREET BATH, NEW YORK.

A building with this equipment could be adopted as a type for all cities of the first and second class.

The pool room should be planned of liberal height, with window openings so arranged as to avoid condensation and the much dreaded draught. The water area of the pool should be proportioned to the dressing room capacity, and the area of the pool should be sufficiently large to promote sanitation. It is customary to plan the length at least twice the width, preferably not over a hundred or less than sixty feet. The floor of the pool should be properly graded, having a shallow end for beginners and allowing a deep place for diving.

There are three different forms of floor sections in use, as shown in the illustrations. The slope may be considered preferable for baths of ordinary capacity, as it gives an unbroken surface and easy fall throughout. For the larger pools the broken floor section may be used. This is much favored in Germany, as it has the advantage of allowing a level floor for beginners, who invariably have a dread of a sloping floor no matter how gradual it may be. The depth of the pool is frequently over ten feet, to obviate all danger in diving, but this plan requires the heating of a large volume of water.

It is desirable to arrange the shower baths in longitudinal lines for ease of supervision as well as simplicity of piping, and it would be well to allow some additional working space at the entrance of the shower bath halls, to permit an uninterrupted movement of the bathers at all times. While the shower halls are frequently worked to the limit of their capacity in the summer season, in winter the attendance falls off rapidly, and arrangements should accordingly be made to shut off a row of showers, a wing, or even an entire floor, should the lack of attendance warrant it. A collapsible compartment might be constructed which could be removed in the dull season. This should, of course, be done without affecting the water-tight qualities of the floor. The surplus bathing hall space could then be used for assembly purposes. It has been noted that the English use their plunge rooms for these purposes during the dull season.



TYPICAL SHOWER COMPARTMENTS, AMERICAN BATH.

There is little to say of the tub rooms and toilets. If the former are considered necessary they should be inconspicuously placed. The general practice of placing the toilets directly in the bathing halls in an interior position is not desirable, as it is far better to depend on outside ventilation.

The laundry is not as yet considered an integral part of the American public bath, but its real value will eventually be recognized. The working classes have an aversion to publicity in their domestic affairs and are reluctant to use the laundry, but if it is properly planned with ample light and air, its advantages and conveniences become so apparent that this feeling of distrust is soon overcome. If the problem demands the placing of the laundry in the basement, the work rooms should be high and the first tier of beams well elevated above the sidewalk, and it would be well to keep the patrons of the laundry from coming in contact with the bathers. The exact disposition of the washing, drying and mangling machines depends entirely on the type of machines used, but in any case it is well not to crowd the machines and to allow liberal working space.

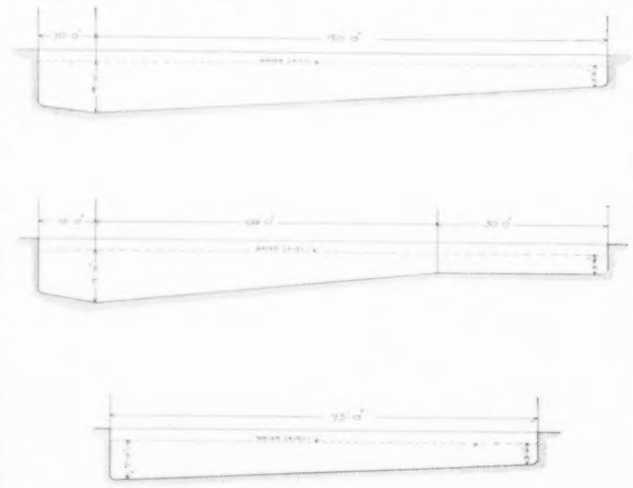
The engine and boiler

room is generally placed under the waiting rooms in our large municipal bath houses, — in a place too restricted, poorly lighted and with little means of direct ventilation. The foreign baths have proved far more liberal in their boiler and engine space. The severe demands made upon this part of the building, the multiplicity of apparatus and pipes, require a liberal distribution of the entire plant, and the architect should give the necessary time and attention to insure not only the accurate placing of the various apparatus but the arrangement of the various lines of piping and valves, as the ultimate success of the building depends on this. In the recently constructed baths in New York City, where space was restricted, it proved advisable to excavate under the sidewalk. This allowed additional source of light and air, which was further assisted by window openings on the rear courts.

Ample room should be provided for the numerous lines of pipes, ducts and filters, also for the pump and other apparatus required. A break in a too compact space makes immediate repairs impossible, and often requires the taking down of a considerable part of the plant. A liberal factor of safety for overload should be provided, as the demands in certain seasons of the year are severe.

A double set of pumps, engines and dynamos are an advantage, although one set is sufficient to run the plant under ordinary conditions .

The coal bins should have sufficient storage for emergency purposes, and the boiler room should be properly isolated from the rest of the plant. The engineering force should be provided with locker rooms, a convenient work room and adjoining toilets. Emergency ladders should be placed at accessible points.



FLOOR SECTIONS FOR POOL BATHS.

The writers have noticed that some of the public baths are not equipped with attendants' rooms; a room for this purpose should be arranged on every floor or wing of the building with proper locker and toilet accommodations.

Superintendent's living quarters is a much mooted question, — whether it is advisable to provide for the superintendent's quarters in bath buildings for cities of the first and second class in this country. About one-third of our institutions are so equipped. They should by all means be provided for. They may be placed in an upper story in order not to diminish the working capacity of the bath, and the cost is more than compensated by the additional care and supervision which the building receives. If possible, the living quarters should be provided with a direct outside entrance, affording at the same time immediate access from the hall to the various shower and bathing rooms of the building. The living quarters are generally disposed over the waiting rooms, or, in case of a second story of showers, above them.

We have discussed the planning and functions of the public bath house and a few words on the construction of the building may be of some value. The materials for the building, as in the hospital, must be primarily selected for their sanitary qualities, but they further require an ability to withstand the severe amount of wear and tear received from the bathing public. The disintegrating effects due to the steam and water must also be considered, and the architect must bear in mind that the waterproofing must be as nearly perfect as possible.

Eliminate as far as possible all openings for pipings, standards or fixtures. It is safe to say that no bath building yet constructed has not suffered more or less from leakage.

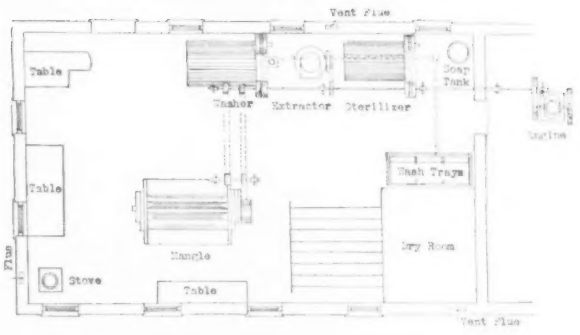
The fittings throughout should be of the strongest character and sufficiently heavy to withstand the hardest usage. For this reason the spray and foot baths, used in the modern Berlin Baths, with their exposed piping and elaborate fittings, are not adaptable for our purposes.

The circulation of water in the bath may be likened to that of the blood in the human system, — the main rising lines to the arteries and the network of branch lines carrying the water to the numerous bath compartments in the remotest parts of the building, to the veins. Perfect circulation is most essential, and, to further this, the street supply must be of sufficient pressure to carry the water to the highest levels without the use of pumps. The street sewers should be of sufficient depth to drain the lines by gravity. All piping must be exposed, should be direct as possible, and have the controlling valves in convenient positions.

The proper cleansing of the surface water of the pool is important, — a superficial spray has been provided for the purpose, generally introduced under considerable pressure through a perforated pipe. The movement of this superficial current is further assisted by arranging an overflow gutter at the opposite end of the basin. The inlets of the pool are so disposed as to further this circulation and keep an even temperature throughout the pool. Considerable difficulty is encountered in producing a uniformly heated volume of water. To overcome the cold spots there are various arrangements provided to obtain these results. A common English method is to increase the circulation by providing a return main from the pool to the boiler and by gravity keep up a constant circulation similar to that in the ordinary house boiler. This method has the serious objection of re-using the old water and from principles of sanitation cannot be commended except in pools where a very moderate amount of work is required. There are also various systems of steam injection, either directly into the pool or else by means of tapping the supply line at certain intervals with injectors of live steam. This produces a rapid cir.

culation of the water, but both systems are subject to the noisy steam hammer, and in the latter case the introduction of live steam into the pool frequently results in severely scalding the bather.

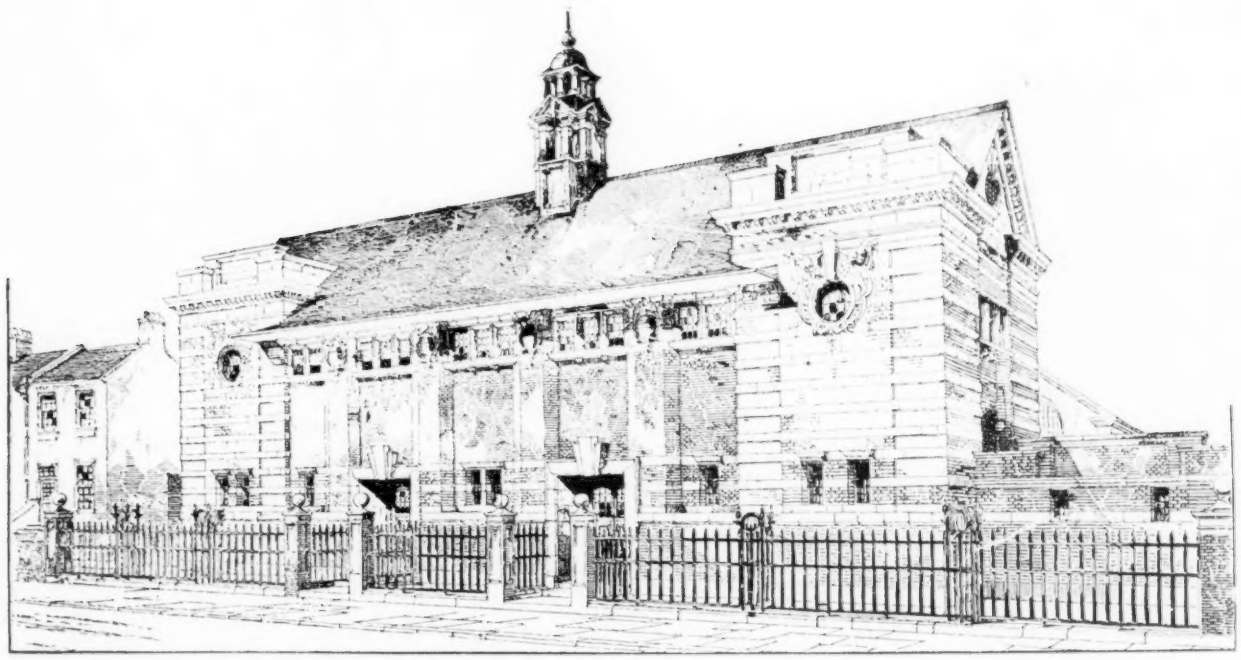
The position of the heating coils, the proximity of the skylights, are all considerations which effect the temperature of the pool.



TYPICAL PLAN OF LAUNDRY FOR PUBLIC BATH.

We have indicated in outline the extent of the modern bath movement. It is evident that our institutions do not compare either in size or impressiveness with foreign bath buildings, but the value of this facility lies not in pretentiousness but in its sanitary and economic features, and it is in this rational direction that our baths have shown progress. It may be that in the modern civic movement sufficient importance will be placed on this much neglected subject to allow the architect some latitude for the realization of his ideas, which will result in a comprehensive system of public baths worthy of American communities and ideals.

(CONCLUDED.)



PUBLIC BATH AT SELLY OAK, ENGLAND. Arnold Mitchell, Architect.

THE task of housing in one city hall the vast and hitherto scattered municipal machinery of London has fallen upon the shoulders of Mr. Ralph Knox of Chelsea, a young architect previously little known to fame. As the author of the successful design he has shown great skill in economizing internal space within an irregular area that fronts the south bank of the Thames by seven hundred feet near the Westminster Bridge. Public discussion has been chiefly directed to the exterior. With the character of Somerset House in mind he has chosen to rely for effect upon long, unbroken horizontal lines and the great mass of the building. The skyline is broken only by eight chimney stacks and a central flèche. The design is generally felt to be a worthy successor to the works of Inigo Jones, Sir Christopher and Sir William Chambers.

IN Paris a society devoting itself to economical buildings for the poor has opened an apartment house for large families only. None with less than three children is admitted. The rents vary from $36.80 to $84.80 a year. The building was immediately filled, and a census showed that the ninety-four separate apartments sheltered six hundred and twenty persons, of whom four hundred and twenty-seven were children. Most of the tenements have a large balcony upon which a good-sized living-room opens. The partitions between the parents' and the children's rooms extend only three-quarters of the height to the ceiling. The window sills are so high as to prevent the children climbing to them; and at every stairway, in addition to the regular steps, there is a flight of steps of half height that the little folks can mount without effort. The fire escapes are unusually complete and commodious.

Armories for the Organized Militia.

LIEUT.-COL. J. HOLLIS WELLS.

(Of Clinton & Russell, Architects.)

IN designing a building to meet the requirements of a military organization, the character and size of the organization must, of course, be taken into account and its needs must be studied.

An armory should be built as nearly fireproof as possible. It should be substantially built and have entrances and exits, which, though ample, should be so arranged as to be easily protected from the mob. There should be enfilading towers with narrow windows so arranged for rifle fire that streets at or near these exits may be cleared.

The building generally should, therefore, be designed in a simple, straightforward manner, combining many of the features of the mediæval fortress or castle, and although it is not anticipated that troops will have to stand a siege therein, nevertheless many of the ideas of early architecture may well be adopted in planning, for soldiers may have to enter and leave their armories under adverse circumstances. The roofs of armories should be easy of access for the troops, and parapets and platforms should be arranged for riflemen so that they may control all surrounding streets and buildings. At least a portion of the building should be higher than the roofs of the buildings adjoining, so that there may be no chance for damage being done from them.

A well-selected hard-burned brick, carefully laid up in cement mortar, is both substantial and economical for front work. Granite, perhaps, is best adapted for special trim of the façades and may be used to excellent advantage for base, copings, band courses, and around windows and doors, but beyond this, unless cost is not to be considered, it is not desirable to go. Troops at any rate are simply a necessary evil, they are expensive to maintain, and the buildings in which they are quartered should be simple and in keeping with the purpose for which they are intended, *i. e.*, for the housing and drilling of bodies of men whose training is along simple, practical martial lines and for the proper storing of quartermasters', commissary and ordnance supplies.

All exterior doors and windows at or near the level of the street should be protected with heavy iron grilles and gates, and double sets of heavy, hard wood doors, hung on specially strong hinges, opening out, are necessary.

In planning the interior of an armory, the size of the property determines the lay-out. Generally in the cities and larger towns where armories are usually located the cost of the property limits its area. If, therefore, it is necessary that the building should be several stories in height, a very excellent plan would be obtained as follows:

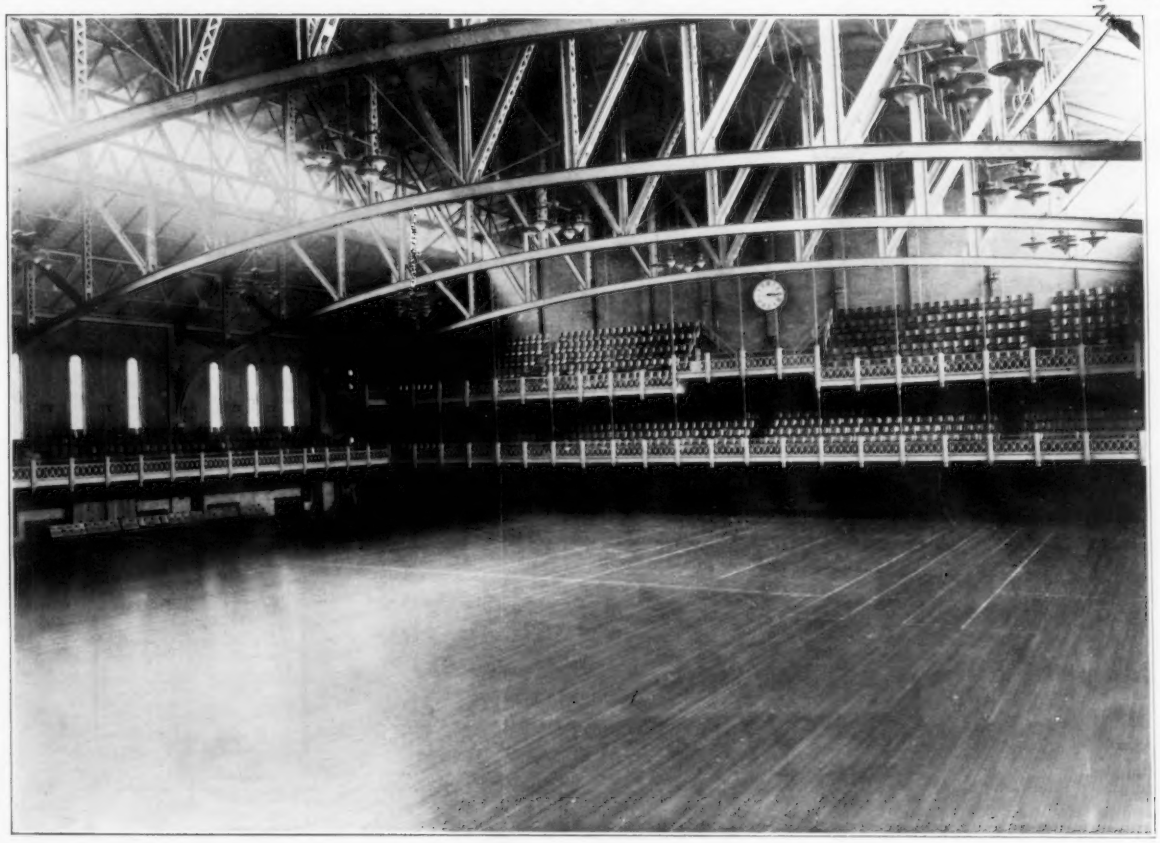
The main consideration is the drill hall, which, if possible, should approximate in size not less than 200 x 300 feet for a regiment of infantry, consisting of twelve companies. The floor should be near the street level and should open directly thereon. The hall should be lighted and ventilated from the outside by windows high up in the walls and above by a clere-story with adjustable sidelights running nearly the entire length of the hall. The clear height of this hall from the floor to the lower chord of the roof trusses should be at least forty feet, except on the sides and ends, where galleries for spectators may be placed, and the height under the lowest point of these galleries should not be less than twelve feet. Galleries should be suspended from the roof trusses so that the drill floor is not obstructed by posts. They should have ample flights of stairs at the four corners of the drill hall leading to exits to the streets.

Except for cavalry, wood floors are preferable generally throughout. The drill-room floor should be designed for a total load of three hundred pounds per square foot. The arches between the floor beams may be brick or hollow terra-cotta blocks brought up level to the tops of the beams, and on top of this may be laid 3 x 4 inch yellow pine sleepers, beveled on the edges and fastened to the I beams 16 inches on centers with strong wrought iron clips. Between the sleepers and level with their tops lay a good rich cinder concrete, and in order to avoid dust through the flooring, lay a covering over the top of the sleepers of hot asphaltic cement and three ply of roofing felt turned up on walls and around all pipes, etc.

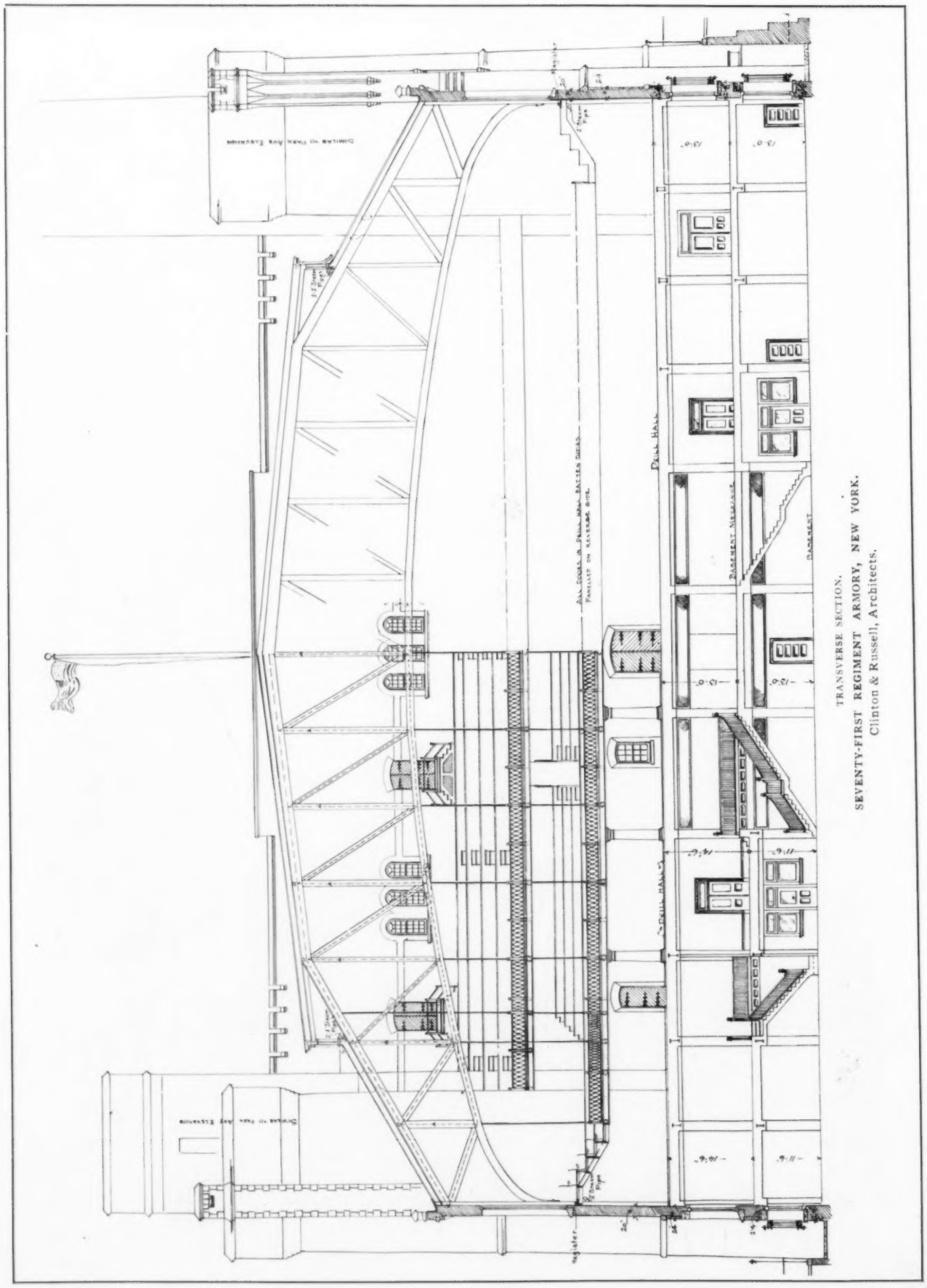
A very satisfactory flooring is a first quality clear, kiln-dried, heart-face, comb-grained Georgia pine, tongued and grooved, blind-nailed to each sleeper with two twenty-penny wire nails. The floor strips should be about two inches wide and two and one-half inches thick laid very close and absolutely level. It should be throughout of the very best selected stock, free from knots, stains and perfectly sound. The best of care should be exercised in selecting this material and in laying it. The entire floor should be smoothly planed, scraped and sandpapered to a satisfactory surface and on completion covered with a hard finishing oil. No base is required around the walls but a one and one-half-inch quarter round molding of yellow pine may be run to obtain a neat finish.

It is unnecessary to plaster or even paint the interior walls of the drill hall; brick laid up in English bond with white struck joints and light terra-cotta trims around window and door openings have proven highly satisfactory both from an artistic and utilitarian standpoint. In fact, generally the staircase and entrance halls may be treated in the same manner.

The roof over the drill hall is generally an interesting problem. An excellent example of this is in the 71st Regiment Armory at Park Avenue and 34th Street, New York City, where the roof is carried by five pin-connected trusses of modified Pratt type with inclined top and bottom chords, the latter being curved to give an outline suggestive of arch construction and secure an increased clearance without involving an unnecessary height of end column to develop large moments of flexure. The trusses are 190 feet 4 inches long center to center of end piers and are 24 feet deep in the center. The bottom chord has a versed sine of about twelve feet and converges from the lower end panel point to intersect the top panel chord at the end pin where it is pin-connected to a steel wall column. The ends of the bottom chords are extended from the lower end panel point by false members tangent



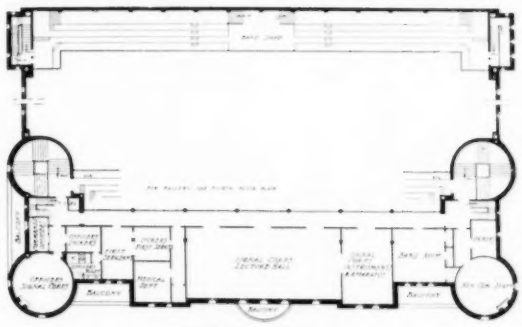
SEVENTY-FIRST REGIMENT ARMORY, PARK AVENUE AND THIRTY-FOURTH STREET, NEW YORK. Clinton & Russell, Architects.



TRANSVERSE SECTION.

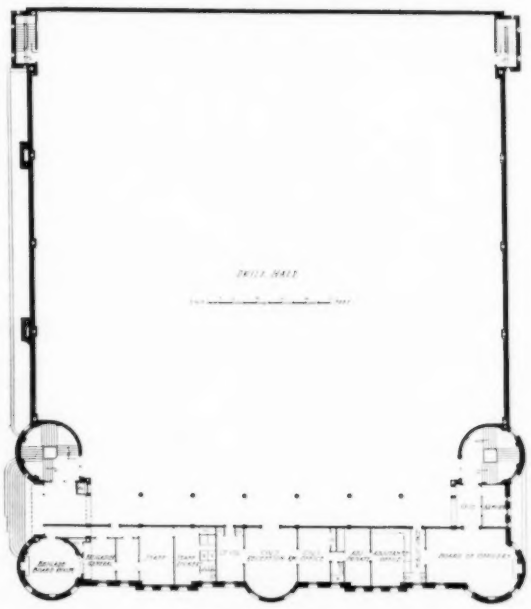
SEVENTY-FIRST REGIMENT ARMORY, NEW YORK.

Clinton & Russell, Architects.

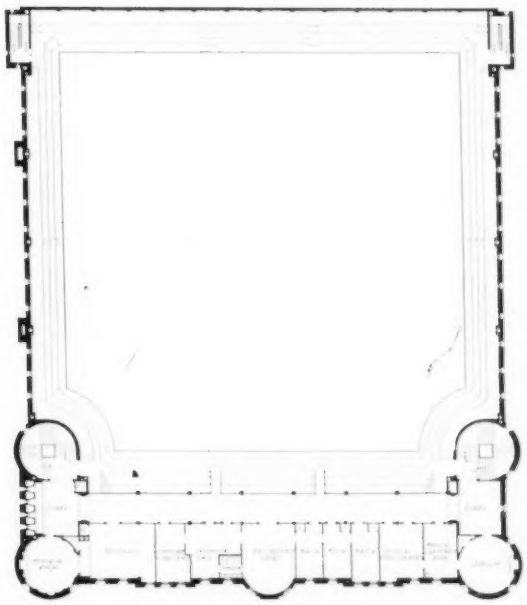


THIRD FLOOR PLAN.

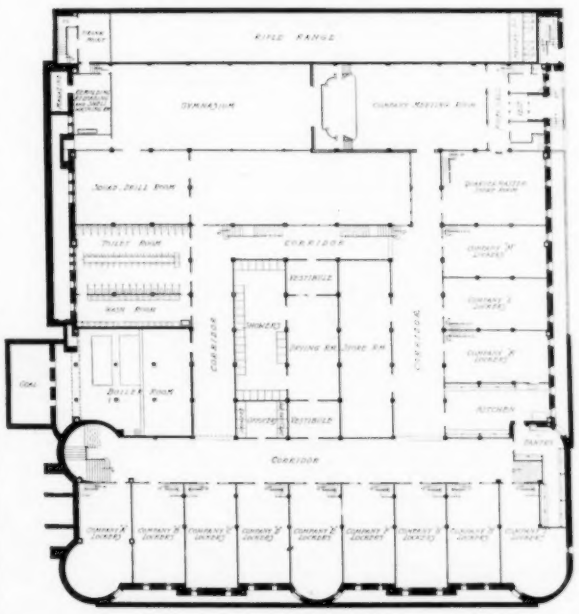
FOURTH FLOOR PLAN.



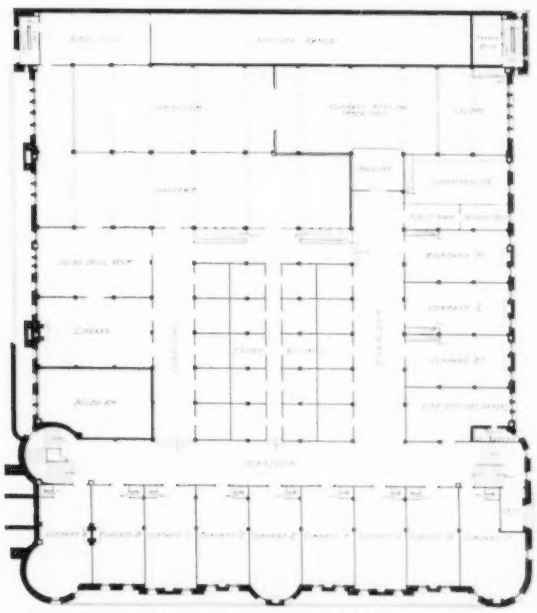
FIRST FLOOR PLAN.



SECOND FLOOR PLAN.

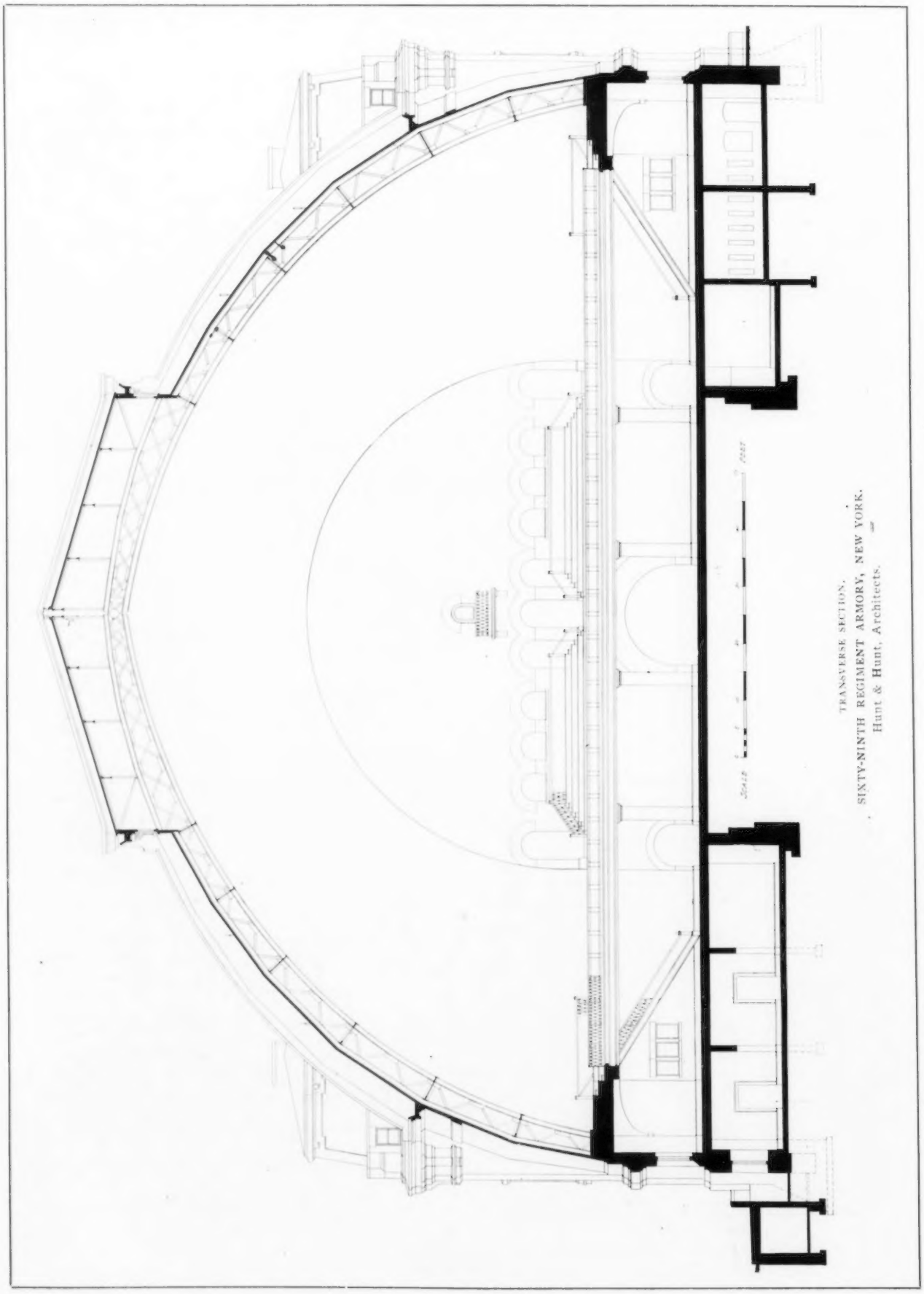


BASEMENT PLAN.



BASEMENT MEZZANINE PLAN.

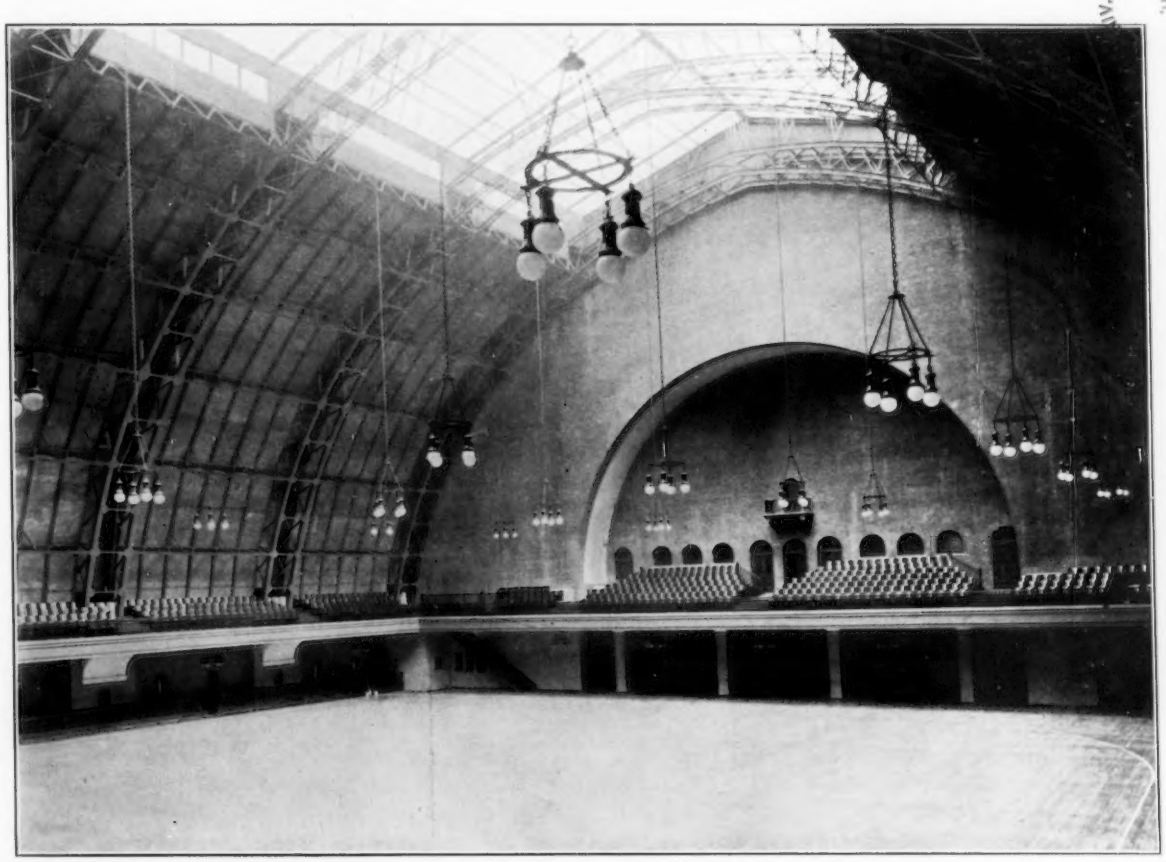
FLOOR PLANS, SEVENTY-FIRST REGIMENT ARMORY, NEW YORK.
Clinton & Russell, Architects.



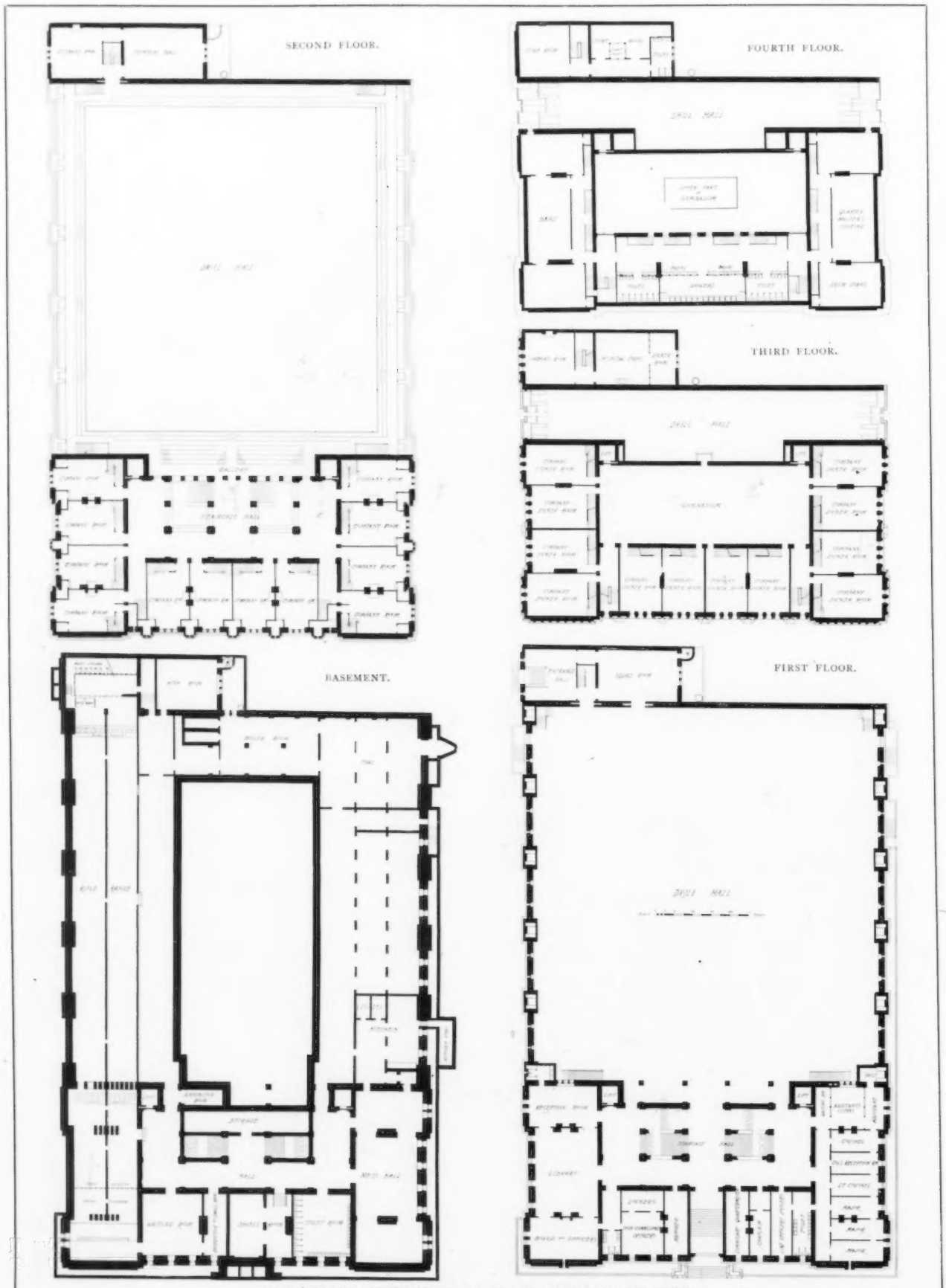
TRANSVERSE SECTION.

SIXTY-NINTH REGIMENT ARMORY, NEW YORK.

Hunt & Hunt, Architects.



SIXTY-NINTH REGIMENT ARMORY, LEXINGTON AVENUE AND TWENTY-SIXTH STREET, NEW YORK.
Hunt & Hunt, Architects.



FLOOR PLANS, SIXTY-NINTH REGIMENT ARMORY, NEW YORK.
Hunt & Hunt, Architects.

to them and curved to make tangent connections with web plates projecting from the sides of the wall columns. These members serve as knee braces uniting the wall columns and trusses and completing the arched outlines of the lower chords. The trusses are supported on 7¾-inch pin-bearings. At one end of the truss this pin engages the top of the wall column and provides a fixed support for the truss. Here the connection plates, to which the top and bottom chords are riveted, are extended below the latter to form jaws which are field riveted to the wall columns and give increased rigidity to the connection. At the other end the bearing pin engages a pair of 16 x 1½-inch vertical link plates about four feet long. The upper ends of these links engage a 7¾-inch pin through the cover plates of the wall column. This arrangement provides a swinging support for the truss and allows longitudinal movement to correspond with temperature variations. The end of the truss projects inside the column and has clearance there between a pair of vertical guide angles, which engage the lower edge of the connection plates and prevent under transverse displacement.

DETAIL OF LEXINGTON AVENUE FAÇADE.
SIXTY-NINTH REGIMENT ARMORY, NEW YORK.
Hunt & Hunt, Architects.

The trusses are connected by longitudinal purlins in vertical planes web-connected to them at each panel point. The purlins are riveted trusses with a uniform depth of about six and one-half feet; part of them have the connections for the vertical suspension rods to carry balcony and gallery platforms. Provisions are also made to carry the gallery suspenders from the first and second panel points at each end, where the vertical rods have nut bearings on the upper ends of vertical angles riveted inside the bottom chord channels. Bent plates about six feet apart are riveted to the top chords of the purlin trusses to form inclined seats for the jack rafters, which are 7-inch I beams receiving the floor system. The wall columns which carry the roof trusses have the required cross-sectional area built up with half a dozen 10-inch cover-plates $\frac{11}{16}$ and ⅝ inch thick. They are made in two-story sections spliced together with cover-plates and horizontal diaphragms between flange angles riveted to the channel webs. The heaviest wall columns have a maximum load of 168 tons and a sectional area of 24 square inches.

The lower chords of the trusses are secured transversely at the center and at the quarter points of each truss by a pair of inclined ⅞-inch sleeve-nut rods in longitudinal vertical planes, which have their upper ends connected to the lower flanges of the purlin trusses at the adjacent panels. These rods have eye-bar heads drilled for 1-inch bolts. At the lower end of the rod this bolt engages lugs at the foot of a pair of vertical angles riveted across the face of the truss. At the upper end the rod is connected by a pair of links to a web plate projecting from the seat of the intermediate purlin. The end purlins have their bottom flange angles extended and built into the brick gable walls. Pairs of lug angles are riveted to them just clear of the brickwork to receive the sway rods. All of the steel and iron work in the drill hall and the ceiling is painted three coats of light green.

Editorial Comment and Miscellany.

THE DEVELOPMENT OF POLYCHROMATIC EXTERIOR GLAZE DECORATION.

ALL who are interested in architecture and the ceramic arts are familiar with the growth and development of glaze decoration. The porcelain tower at Nankin, built 833 B. C., was one of the best examples of exterior polychromatic glaze decoration. The Assyrians, Egyptians, Italians and Spaniards have all left many beautiful examples of what has been done with colored glazes applied to building exteriors and interiors — some of them date back to 3,000 B. C.

The glazes mostly used by the ancients and during mediæval times were the transparent lead, and in some cases, as in Lucca Della Robbia's work, the opaque tin enamels. The best examples of polychromatic glaze work are to be found in the Mediterranean countries. The clear air, colored skies and changing waters furnished inspiration for the early ceramists, and they have handed down to posterity records of color which will neither fade away nor be destroyed by the ravages of time.

The Greeks, not satisfied with monochrome for their beautiful marble temples and public buildings, embellished them with various colored paints; it almost seems a sacrilege to us, but what was the effect? They have stood the architectural criticism of centuries, and are now being reproduced in more durable material.

Terra cotta modeled in every conceivable design, glazed with every known color and texture, is within the reach of every architect, and there is no reason why, with all of our advanced methods of manufacture and the discovery of the lost arts of glazing, more monuments of architectural beauty, such as the Academy of Music in Brooklyn, will not be erected.

This building of Byzantine architecture, modeled in high relief and glazed in oriental tones, covers a city block. While the glaze color treatment has been criticised by some, this is no reason why polychromatic glazed exteriors should be condemned. Those who criticise this sort of work, with an idea toward condemning it, stand in the way of architectural and ceramic progress, and incidentally in their own light. This is the only means of beautifying our cities with a sanitary fireproof and weather-proof material. — *Herman A. Plusch, in the Keramic Studio.*

MAIN BUILDING, UNIVERSITY OF MINNESOTA, MINNEAPOLIS, MINN.
Clarence H. Johnson, Architect.
Two hundred and fifty thousand mottled granite brick used for facing. Made by Twin City Brick Co., St. Paul, Minn.

THE Right Hon. John Burns has introduced into Parliament a bill which has for its object the scientific planning and improving of cities and towns with the aid and authority of the Government. The general welfare, rather than that of the individual, is to dominate. The growth and success of this idea in England and on the Continent, the substantial sums contributed by individuals there to further the propaganda, the inquiries started by very influential persons here, the proposal to have foreign experts lecture on the subject in this country; these things foretell a time, perhaps, when not only individual buildings will be designed, but also their arrangement in groups, and their relation to each other will follow a pre-ordained plan, when localities will be improved with a view to the public weal and not left to the fate of land speculators.

REFECTORY AND BOAT HOUSE, GARFIELD PARK, CHICAGO.
W. C. Zimmerman, Architect.
Roof of Green Glaze Tile made by Ludowici-Celadon Company.

THE TOLL OF CARELESSNESS.

DURING the last five years fires in the United States have destroyed property valued at $1,257,716,955, or an average of $251,000,000 a year. The tabulation by underwriters shows that the greater number of fires come from preventable causes, such as defective chimneys and flues, fireplaces and heating and lighting apparatus. Carelessness in construction and in maintenance and protection of property by owner or tenant is responsible for this waste of property, says the *Boston Herald*. The human fault cannot be eliminated entirely, but competent, honest inspection at the time of construction and at stated intervals thereafter should reduce the percentage of preventable fires. New laws are needed to keep pace with development of the builders' craft. But the greatest need is better enforcement of the laws that now exist.

APARTMENT HOUSE, PARK AVENUE AND SIXTY-FIRST STREET, NEW YORK.

PLANNED for one apartment on each floor, except the first floor, on which, in connection with the basement, are two duplex apartments. Rooms are finished in white enameled wood with mahogany doors and hard wood floors. Each apartment is furnished with regulated steam heat, hot and cold water, artificial refrigeration and a vacuum cleaning system. In each apartment are five fireplaces with independent flues. There are facilities in the basement for washing, drying and ironing and for storage. Two safes for valuables are built in the walls of each apartment.

The entire façade above the third story, including the cornice, bay windows and balconies, is of mat glaze terra cotta, which matches the lower stories, which are of marble. The terra cotta was furnished by the Atlantic Terra Cotta Company.

DETAILS FOR ST. CLARE'S CHURCH, NEW YORK.
N. Serracino, Architect.
Made by Atlantic Terra Cotta Company.

BUILDING OPERATIONS FOR MAY.

OFFICIAL reports of building operations in forty-five leading cities throughout the country received by *The American Contractor*, New York, show somewhat of an improvement as the season advances. The aggregate loss, as compared with May, 1907, is 25 per cent, whereas the previous month suffered a decrease of 33 per cent, as compared with 1907. Only ten cities reported an increase, ranging from 1 to 163 per cent, while thirty-five show losses ranging from 2 to 73 per cent.

HOUSE AT CLEVELAND OHIO.
Harlen E. Shimmin, Architect.
Roofed with Imperial Spanish Red Tile.
Made by Ludowici-Celadon Co.

APARTMENT HOUSE, MADISON AVENUE AND EAST FIFTY-FIFTH STREET NEW YORK.

PLANNED for one apartment on each floor. The halls are spacious; there are separate quarters for servants, and additional rooms may be had by the tenants when desired. The system of heating and ventilation gives to each room a complete change of filtered air at short intervals without the necessity of opening the windows. Heat is supplied from the street mains of the New York Steam Company.

SPANDRIL OVER AN ENTRANCE.
Schmidt, Garden & Martin, Architects.
Northwestern Terra Cotta Co., Makers

MR. OSCAR HAMMERSTEIN, who intends to lift Philadelphia to the honor of supporting permanent opera, intends also to give that city a demonstration of speed. Demolition on the site was begun March 30, and the impressario declares that the first performance of grand opera will be given on the evening of November 17. Mr. Hammerstein is also something of an architect, — has been, like many other people, "his own architect." "One of the unpublished New York oddities of Hammerstein," says the Philadelphia *North American*, "was his acting as his own architect of the Victoria Theater, and failing to note, until a week before its opening, that he had not provided for a box office in his plans."

THE famous Drury Lane Theater in London was entirely destroyed by fire on March 25. The ruins of this, one of the most celebrated playhouses in the world, are full of memories. It is the third time that it has been destroyed by fire. The original building, erected under royal patent in 1663 by Thomas Killigrew, was burned in 1672. Two years later, when the theater was rebuilt, the architect was Sir Christopher Wren. Colley Cibber and his associates managed it through palmy days and later gave way to Garrick, who, with Peg Woffington and Kitty Clive, made the house a landmark in London's dramatic history. In 1791 the second house was torn down and another, under the management of Richard Brinsley Sheridan, was erected. In 1809 this building burned, and the one just destroyed was erected three years later.

PROBABLY only a few persons now living will be able to see the Washington Cathedral completed, but none can fail to be impressed with the design by the late Henry Bodley of London and Henry Vaughan of Boston. This, as exhibited at the Corcoran Gallery in Washington during the last few weeks, is seen to be based upon the recognized English precedents; and while conservative of conception, it is destined to be a great and lasting ornament when reared upon Mount St. Alban.

THE demand for buildings in Washington capable of accommodating large gatherings of people seems never to be adequately filled. The Tuberculosis Congress has applied for permission to use the old Pennsylvania Railroad Station at Sixth and B streets. Already a portion of this has been claimed by the Treasury Department for the storage of articles intended for the coming exposition at Seattle, and the National Museum also desires it for storage until the museum's new building in the Smithsonian grounds is completed. Under these conditions certainly activity in public building at Washington cannot easily be overdone.

THIS will be a record year for new building at Princeton University. The expenditures aggregate nearly two million dollars. The new physical laboratory is now building, the laboratory of biology and geology will be started this month, and soon, also, the Gothic dormitory, presented by the Class of '77. In the near future are to be started the freshman dormitory, presented by Mrs. Russell Sage; the John R. Thomson Grad-

BUILDING FOR I. O. O. F., BUFFALO.
Thomas W. Harris, Architect.
Light brick used in base and trim made by Kittanning Brick Co.

DETAIL BY F. H. KIMBALL, ARCHITECT.
New York Architectural Terra Cotta Co., Makers.

uate College and an additional dormitory to be built by several graduate classes. Two new club-houses are about completed and a group of ten houses for members of the faculty. Ten more faculty houses are under construction.

HOLLOW BLOCK WALLS WITH OUTSIDE VENEER OF BRICKS.

A SUBSCRIBER writes as follows: "I have built for myself a small house in which I have used hollow terra-cotta building blocks for the walls with a veneer of brick on the outside,—all of the partitions and the foundation being of hollow blocks. It is two stories and attic above basement. I have had no difficulty in keeping it warm in winter and find it far cooler in summer than any house I have ever lived in. I have had a wide experience in building houses and firmly believe that I have solved the problem in a most satisfactory manner. The cost, it may be added, exceeded very little that of wood construction."

IN GENERAL.

The City Parks Association of Philadelphia in its endeavor to stimulate interest in the development, not only of new parks for the city, but in creating public sentiment in favor of making better use of what the city already has in the way of open spaces, has appropriated one hundred dollars for a prize for a scheme of decoration for the City Hall Courtyard and the pavements surrounding this building. They have appointed John F. Lewis, President of the Pennsylvania Academy of the Fine Arts; David Knickerbacker Boyd, President of the Philadelphia Chapter, American Institute of Architects, and Milton B. Medary, Jr., President of the T-Square Club, to act as a Committee and Jury of Award to arrange an open public competition, to secure plans and drawings with the above end in view. The Commission has associated Prof. Paul P. Cret of the University of Pennsylvania to assist them in carrying out this work.

In the entrance to Prospect Park at Ninth Avenue and Fifteenth Street, and the Monument to the Prison Ship Martyrs, Brooklyn will possess two works of the late Stanford White that are distinctly his own. The monument will be dedicated in October. It consists of a Doric shaft of Newport white granite, rising from a plaza, which has the impressive dimensions of an 18-foot diameter at base and 14 feet at the necking and a height of 150 feet. At the top a platform 20 feet square constituting an abacus will support a bronze urn 28 feet high. The shaft is pierced by a well 9 feet in diameter containing a stairway and elevator. The bones of the prison-ship martyrs will be contained in brick vaults under the monument.

The National Society of the Fine Arts, the Washington Architectural Club and the Washington Chapter, A. I. A., invite competitive plans for the arrangement of stands for spectators on the route of the inaugural procession. Three prizes are offered: First, $300; second and third, $100, each. The amount of these prizes will be increased if the funds available permit. The following will act as a jury: J. R. Marshall, T. J. D. Fuller, Frederick D. Owen, Frank D Millet, John B. Larner. Further particulars may be had if desired by addressing Percy Ash, Secretary, Washington Chapter, A. I. A.

DETAIL BY J. WARNER ALLEN, ARCHITECT.
South Amboy Terra Cotta Co., Makers.

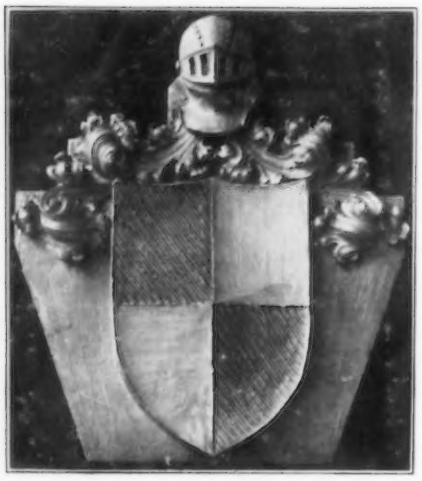
At the annual meeting of the Washington Architectural Club held June 6 the following officers were elected: Hector McAllister, President; Leo J. Weissenborn, Vice-President; Charles S. Salin, Secretary; Daniel J. Lix, Treasurer; Louis A Simon, Francis B. Wheaton, Waddy B. Wood, Directors.

The well-known group of dormitories of the University of Pennsylvania is to be enlarged by means of a gift from an unknown donor, increasing the capacity of the buildings to eight hundred students.

The Rockefeller Institute at Sixty-sixth Street and the East River, New York City, has received an additional $500,000 from its founder, which sum will be used for the erection of a new building near the present institute.

On May 23 the Hanna Monument was unveiled at Cleveland. It is the work of the late Augustus St. Gaudens and is supported by a pedestal designed by Henry Bacon.

DETAIL BY HERMAN MILLER, ARCHITECT.
Conkling-Armstrong Terra Cotta Co., Makers.



DETAILS BY L. A. GOLDSTONE, ARCHITECT.
New Jersey Terra Cotta Co., Makers.

The Northwestern University has received a gift of $150,000 for a gymnasium building.

T. Wendell Bailey, architect, has opened an office in the American Express Building, Oklahoma City, Okla. Manufacturers' catalogues and samples desired.

Robert Bickel, architect, and C. I. Auten, civil engineer, have opened an office as Architects and Engineers in Loyal Guard Building, Flint, Mich. Manufacturers' catalogues and samples desired.

Anthony J. Blix, architect, formerly of St. Cloud, Minn., has opened an office in the Temple Court, Minneapolis.

Parker Fiske, of Fiske & Co., New York and Boston, a graduate of the Massachusetts Institute of Technology, is an enthusiastic student of the best brick architecture found in this country and abroad. As a result of his study of color and texture effects, which may be obtained and which have been obtained by an intelligent and artistic use of materials, his company will issue a series of booklets, some of them illustrated, dealing with face brickwork. The first two of these booklets, one entitled "Fashions in Face Bricks" and the other "Some Good Brickwork," have just come to hand and we are glad to commend them as well worth study.

The terra cotta used in the Academy of Music, Brooklyn, Herts & Talent, architects, mentioned in Mr. Plusch's article which appears in another column of this issue, was furnished by the Atlantic Terra Cotta Company.

The Grueby Faience Company is now engaged in enlarging its plant and bringing it up to date in all respects to better meet the increasing demand for architectural faience. Karl Langenbeck, one of the leading chemists in ceramics in this country, has been engaged as superintendent for the enlarged plant.

The architectural terra-cotta (polychrome) used in the Bronx Church House, Bosworth & Holden, architects, illustrated in the plate form of this issue, was furnished by the Atlantic Terra Cotta Company.

NEW BOOKS.

ARCHITECTURAL COMPOSITION. By John Beverley Robinson. An attempt to order and phrase ideas which hitherto have been only felt by the instinctive taste of designers. Illustrated by eighty-eight half-tone engravings and eighty-five line drawings. New York: D. Van Nostrand Company. Price, $2.50.

KIDDER'S ARCHITECTS' AND BUILDERS' POCKET-BOOK. Fifteenth edition revised. Illustrated with one thousand engravings mostly from original designs. New York: John Wiley & Sons. Price, $5.00.

DECORATION OF METAL, WOOD, GLASS, ETC. Edited by H. C. Standage. A book for manufacturers, mechanics, painters, decorators and all workmen in the fancy trades. New York: John Wiley & Sons. Price, $2.00.

THE COMMUTER'S GARDEN RECORD. Compiled and designed by Amy Carol Rand. New York: H. M. Caldwell Company.

BUNGALOWS, CAMPS AND MOUNTAIN HOUSES. Elaborately illustrated and accompanied by full descriptive text. New York: William T. Comstock. Price, $2.00.

THE ARCHITECTURAL ANNUAL. This work provides a means for the intercourse of professional ideas by word and illustration of men who make the Architectural League of America what it is, and to acquaint those widely separated members more closely with the opinions of their contemporaries and the product of their skill. A large portion of the edition having ing been subscribed for by the members of the League, the committee announce that the remaining volumes may be obtained from M. A. Vinson, 205 Caxton Building, Cleveland. Price, $2.00.

DETAIL FOR CAFÉ.
G. A. Mueller, Architect.
Made by Brick Terra Cotta and Tile Co.

KIDDER'S ARCHITECTS' *and* BUILDERS' POCKET-BOOK
FIFTEENTH EDITION, REVISED
The changes in this edition consist of the correction of all typographical errors reported to the publishers, and the rewriting of Chapters XXIII and XXIV. This work has been done by Rudolph P. Miller. Professor Alvah H. Sabin has also brought the section on Paints and Varnishes up to date.
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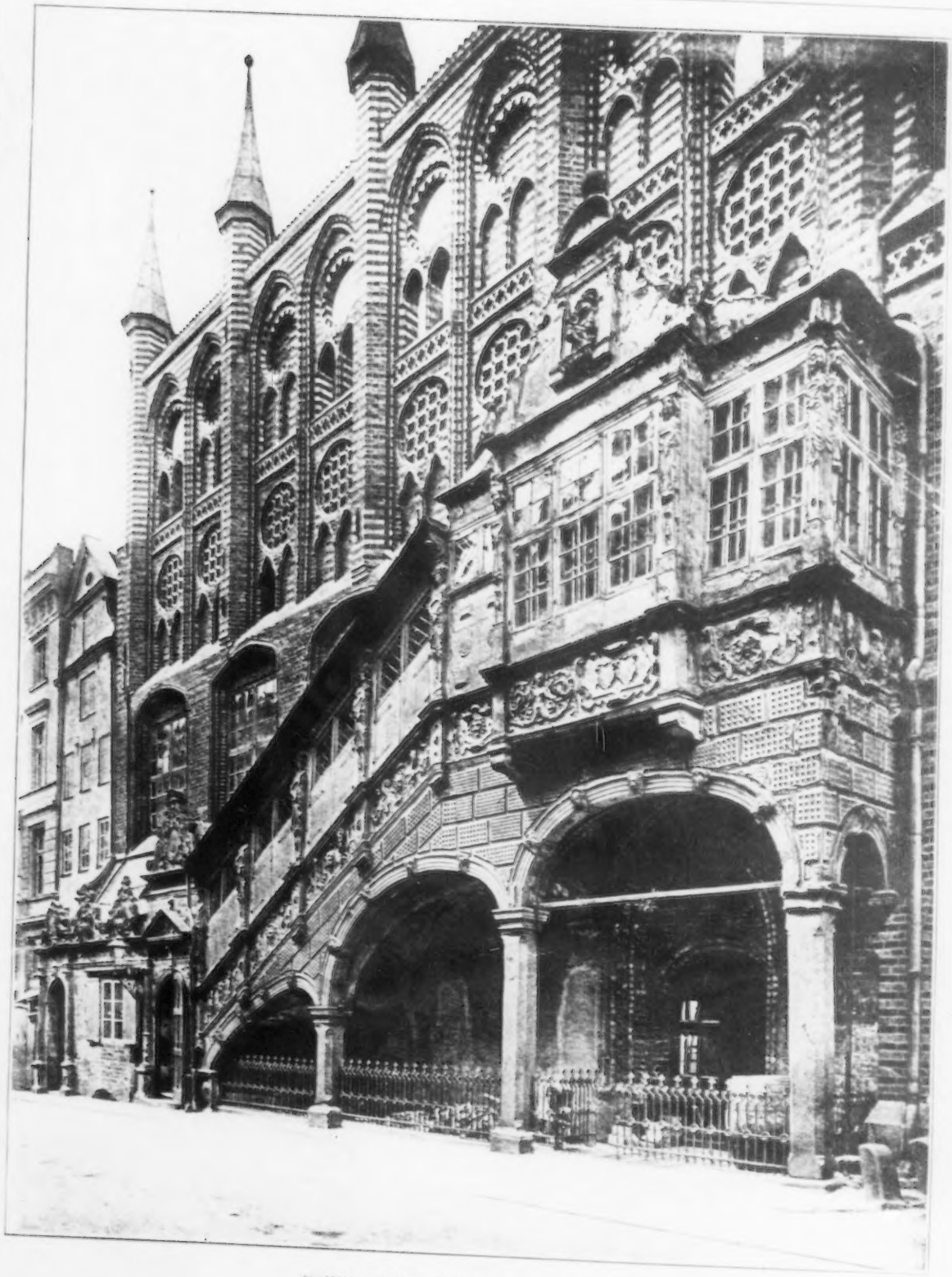
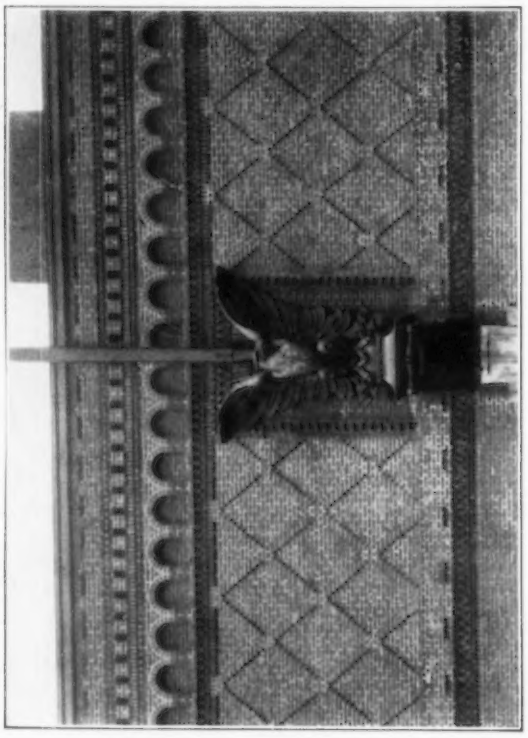
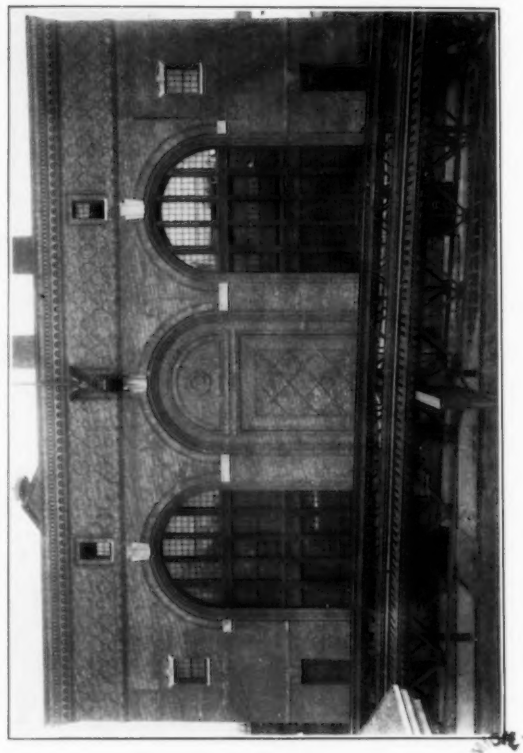
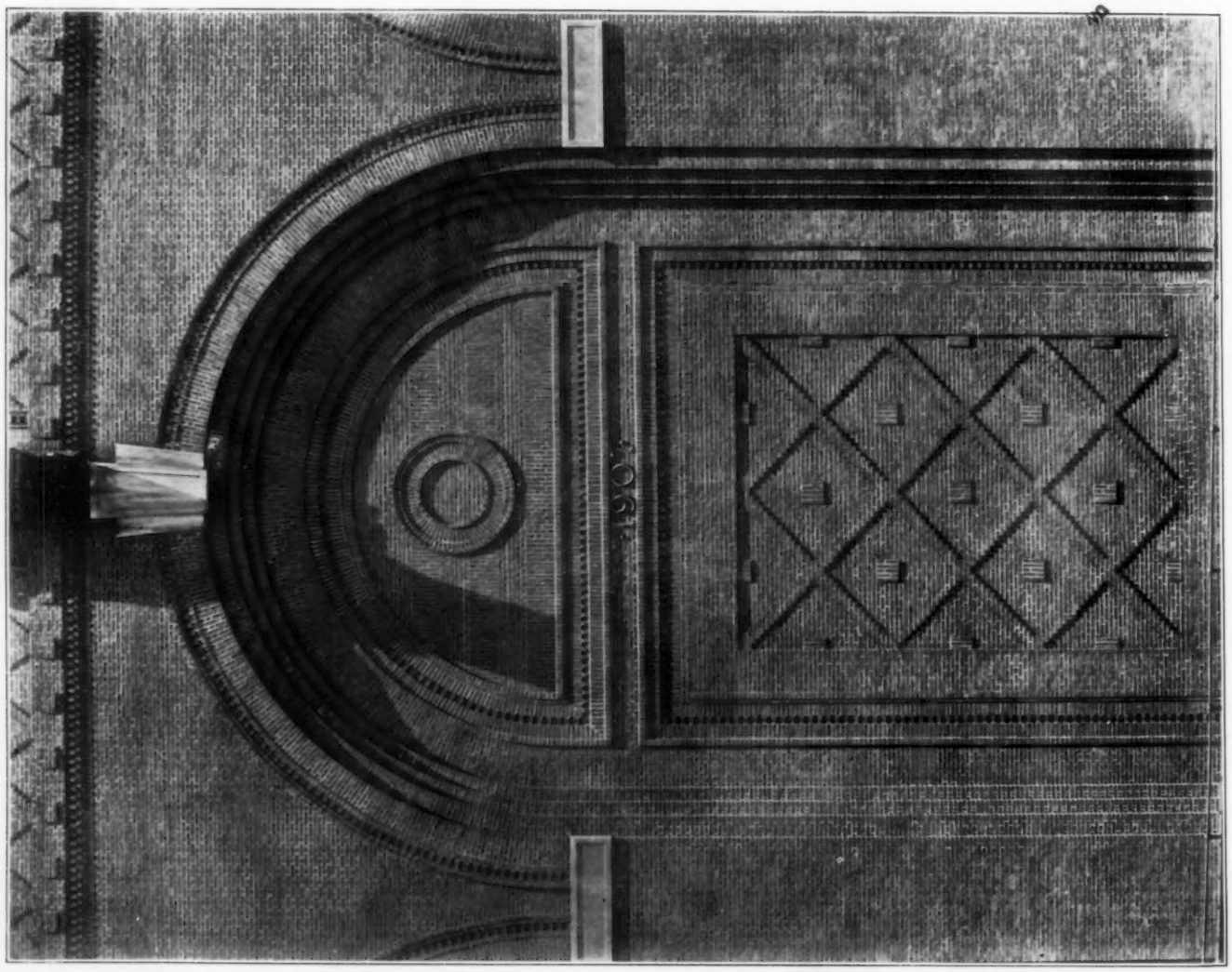


TOWN HALL, LUBECK, GERMANY

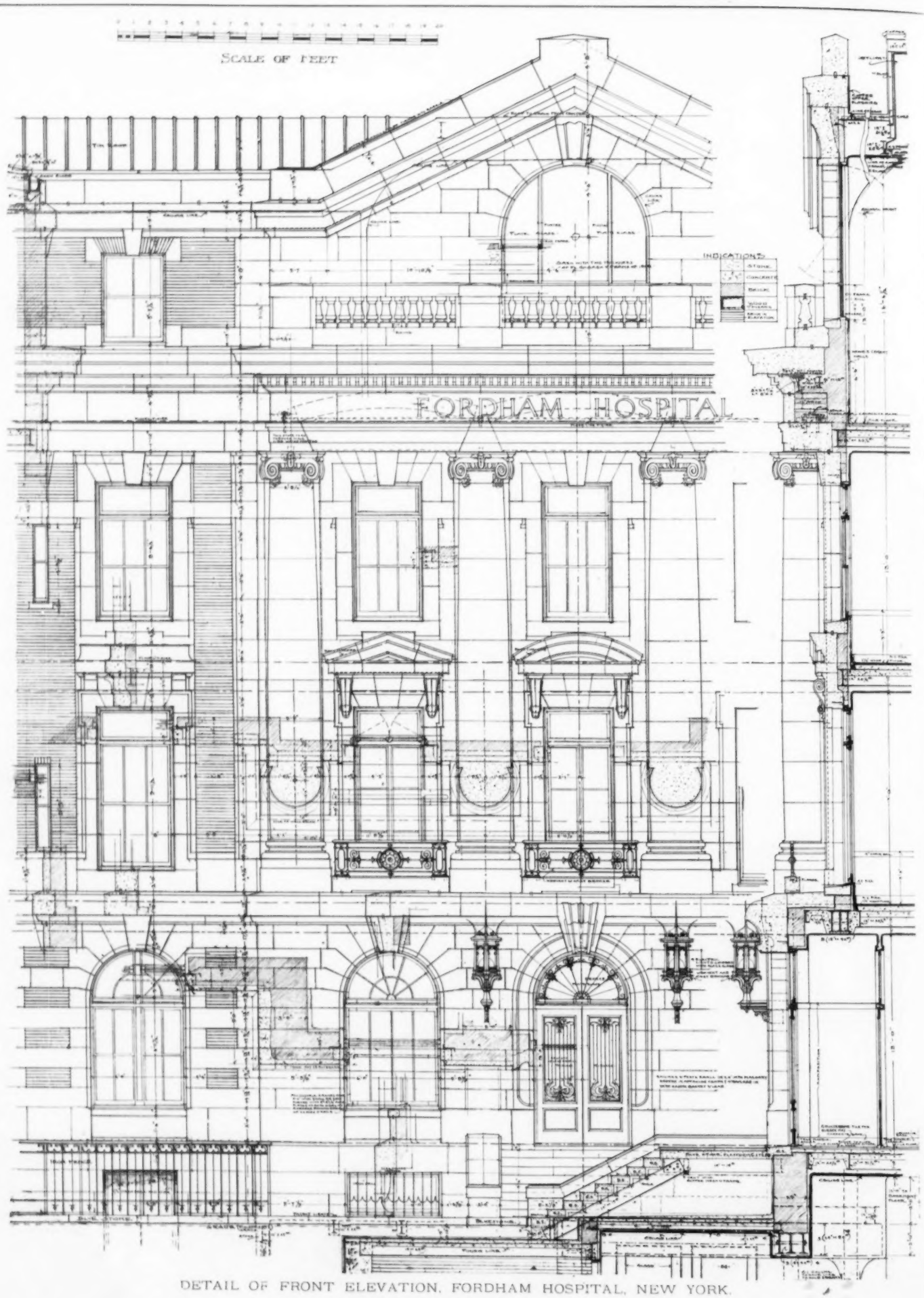




POWER STATION FOR BOSTON ELEVATED RAILWAY COMPANY, BOSTON.
F. F. LOWE, ARCHITECT.
ROBERT S. PEABODY, CONSULTING ARCHITECT.

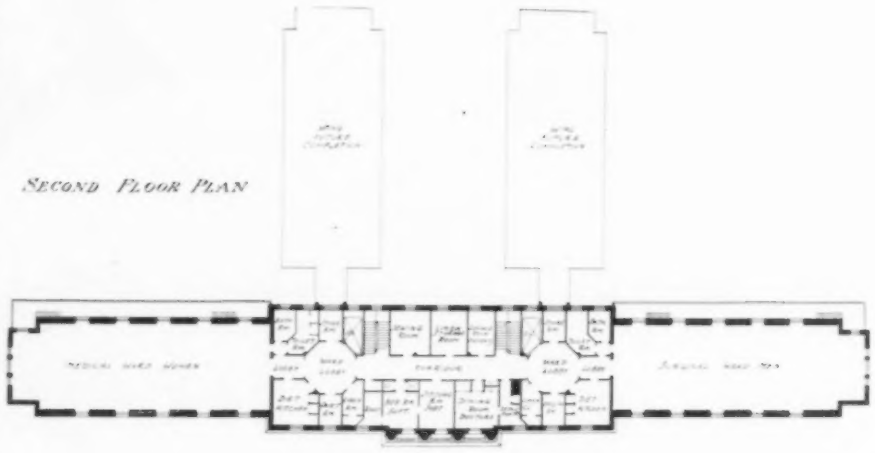


FORDHAM HOSPITAL, BOROUGH OF BRONX, NEW YORK.
RAYMOND F. ALMIRALL, ARCHITECT.

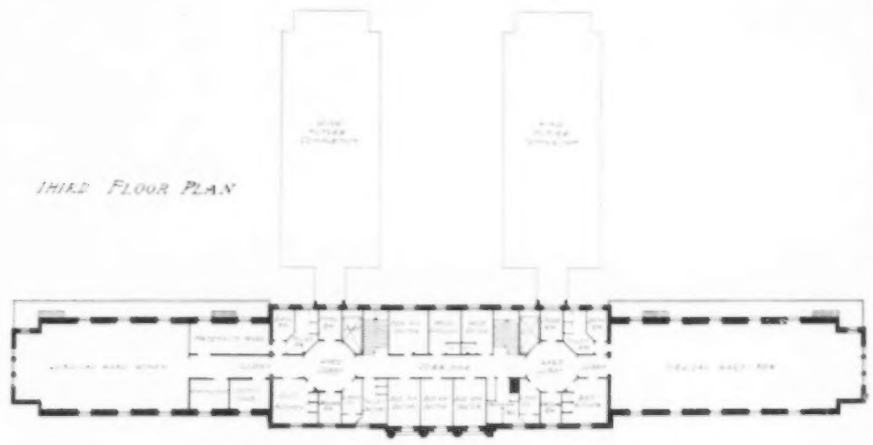


DETAIL OF FRONT ELEVATION, FORDHAM HOSPITAL, NEW YORK.
RAYMOND F. ALMIRALL, ARCHITECT.

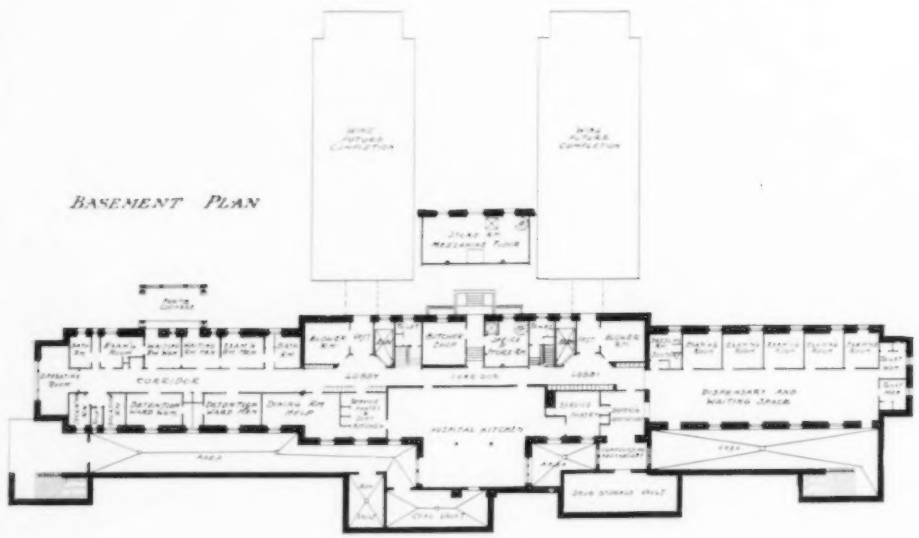
SECOND FLOOR PLAN



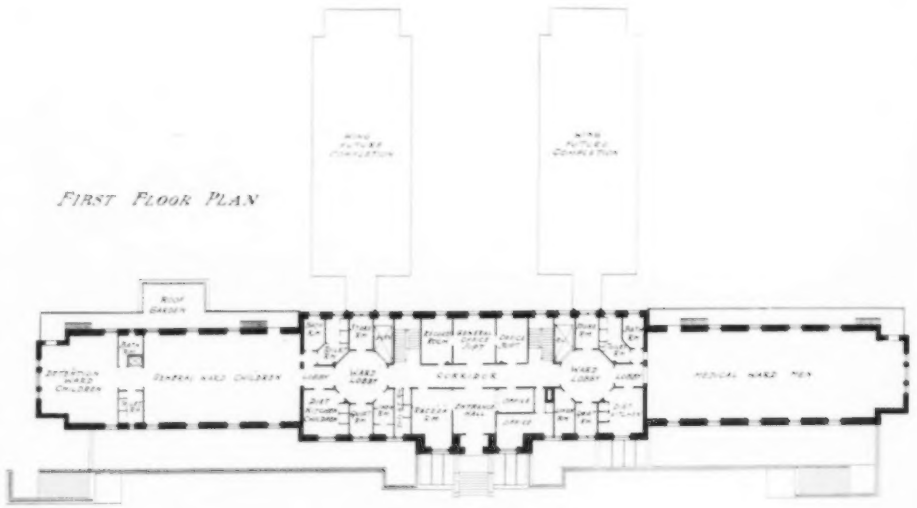
THIRD FLOOR PLAN



BASEMENT PLAN



FIRST FLOOR PLAN



FLOOR PLANS, FORDHAM HOSPITAL, BOROUGH OF BRONX, NEW YORK.
RAYMOND F. ALMIRALL, ARCHITECT.

NURSES HOME

AND

AMBULANCE STATION.

STABLE AND MORGUE.

FORDHAM HOSPITAL.

NEW YORK.

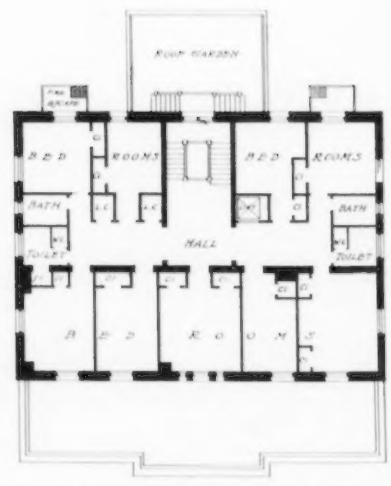
RAYMOND F. ALMIRALL.

ARCHITECT.

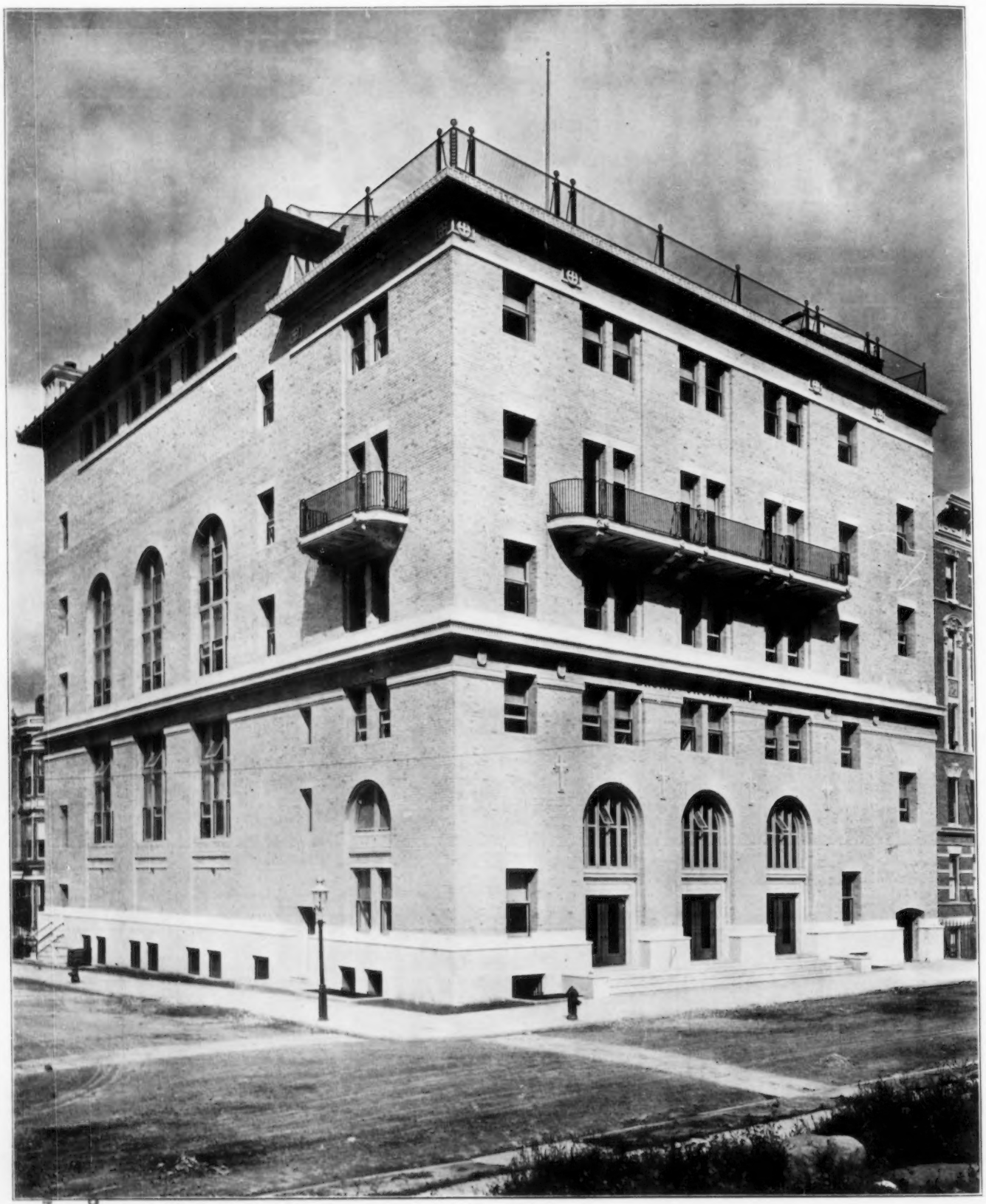
BASEMENT PLAN

FIRST FLOOR PLAN

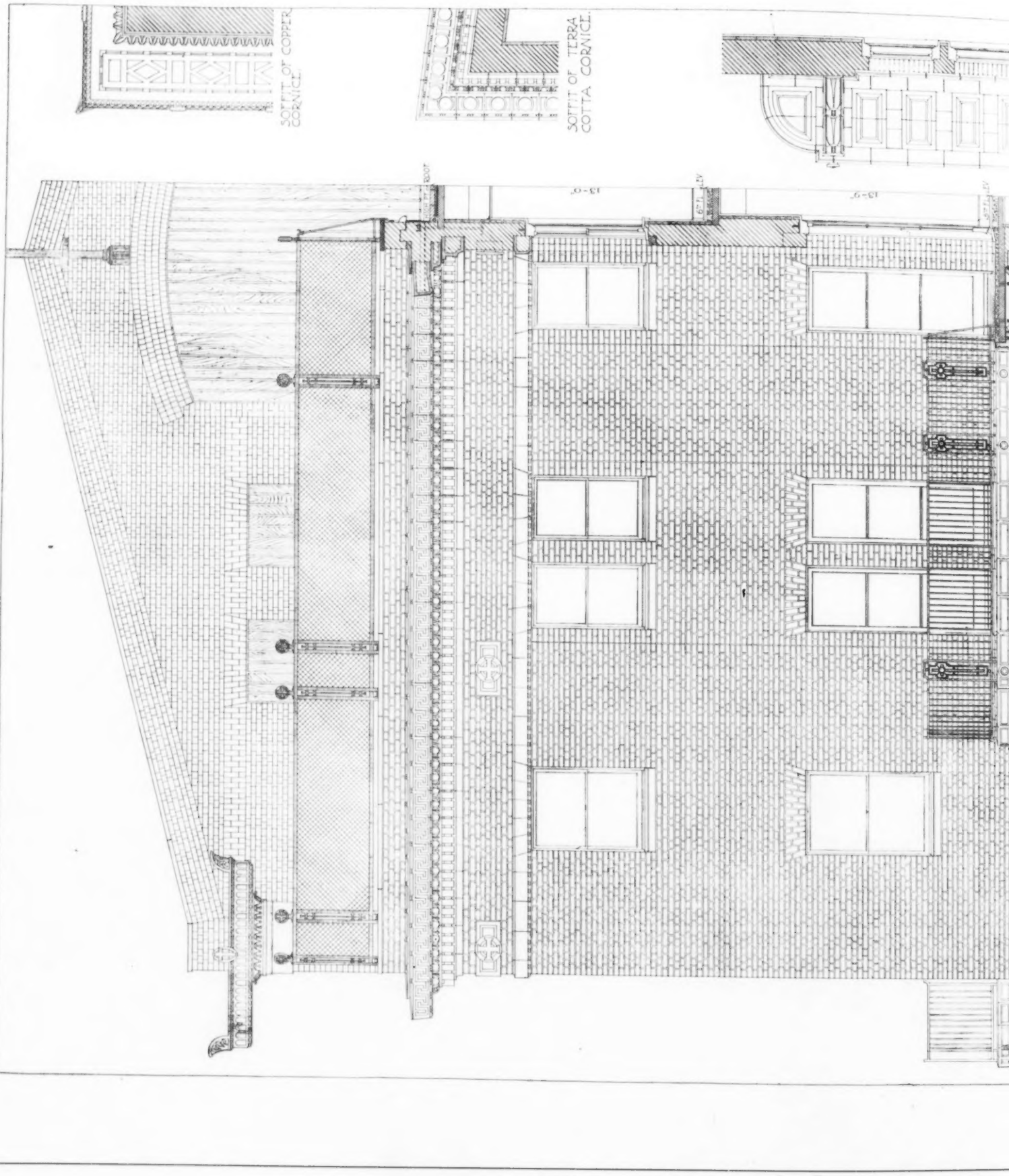
NURSES HOME



SECOND & THIRD FLOOR PLANS



BRONX CHURCH HOUSE, FULTON AVENUE AND 171ST STREET, NEW YORK.
BOSWORTH & HOLDEN, ARCHITECTS.


SOFFIT OF COPPER CORNICE.
SOFFIT OF TERRA COTTA CORNICE.
ROOF
13'-0"
13'-0"

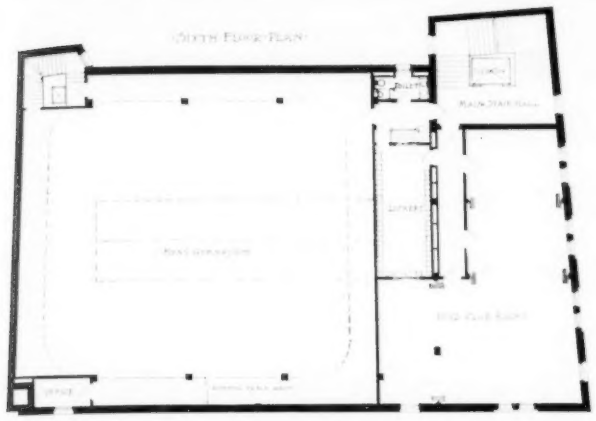
BRONX CHURCH HOUSE, FULTON AVENUE AND 171ST STREET, NEW YORK.
BOSWORTH & HOLDEN, ARCHITECTS.

DETAIL OF FULTON AVENUE ELEVATION.

BRONX CHURCH HOUSE,
ON FULTON AVE. & 171st ST.,
NEW YORK CITY.

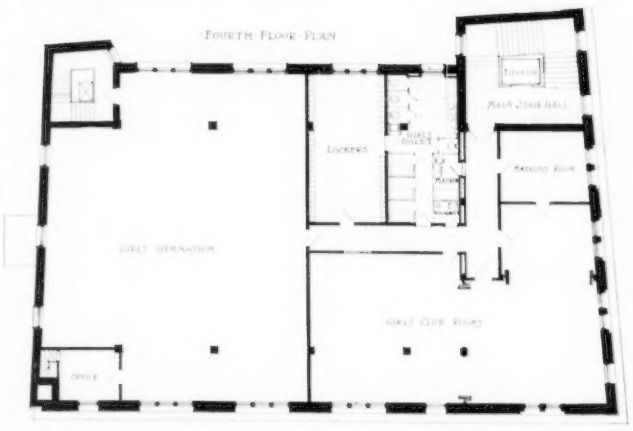
HALF ELEVATION ON FULTON AVE.

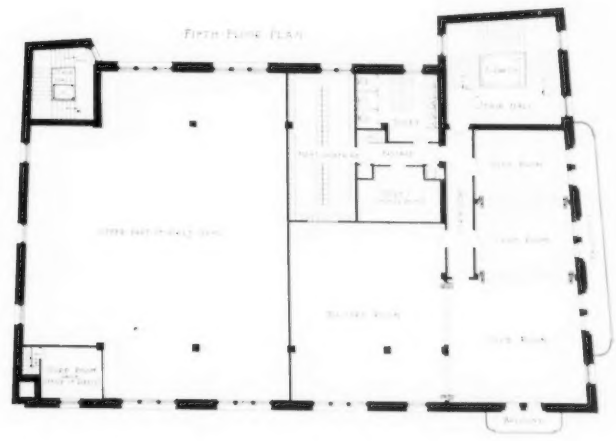
SCALE, 1/8 INCH TO FOOT.

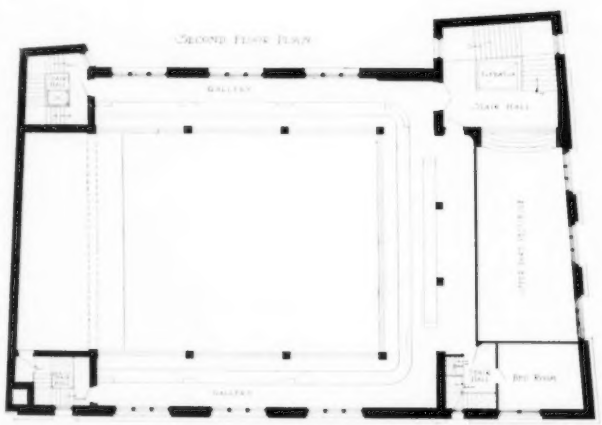


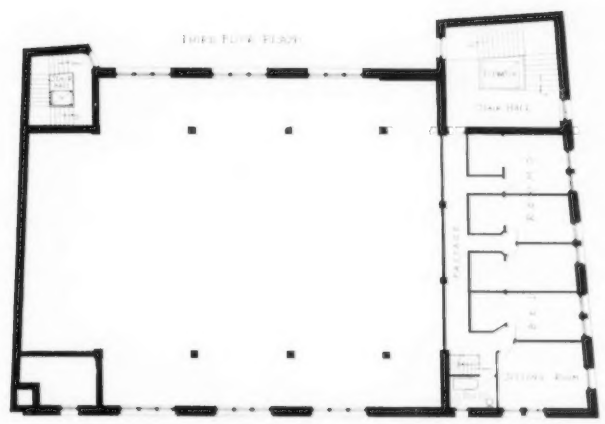
FLOOR PLANS,
BRONX CHURCH HOUSE,
NEW YORK

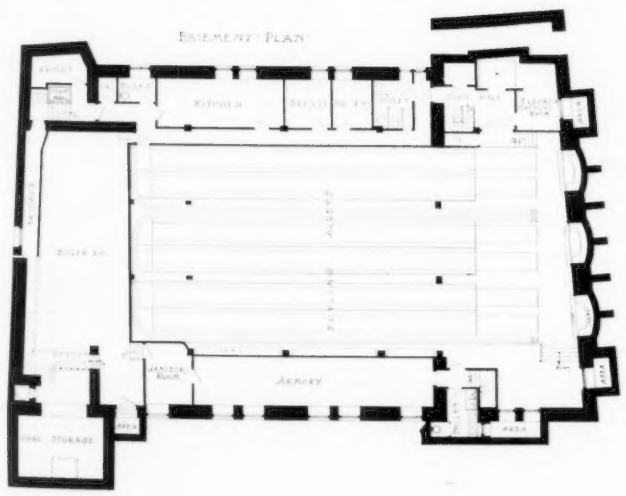
BOSWORTH & HOLDEN
ARCHITECTS

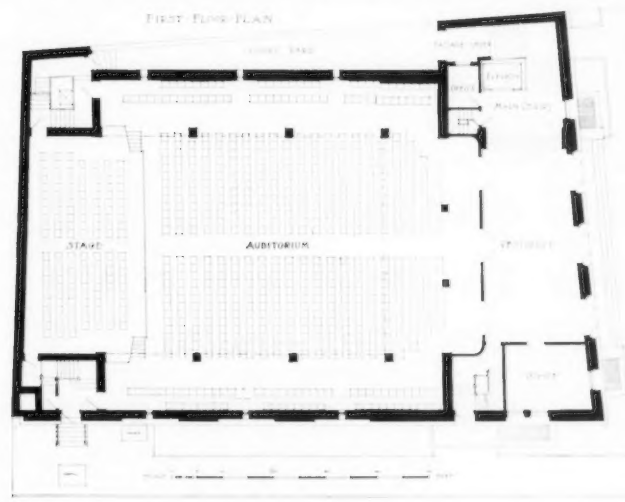


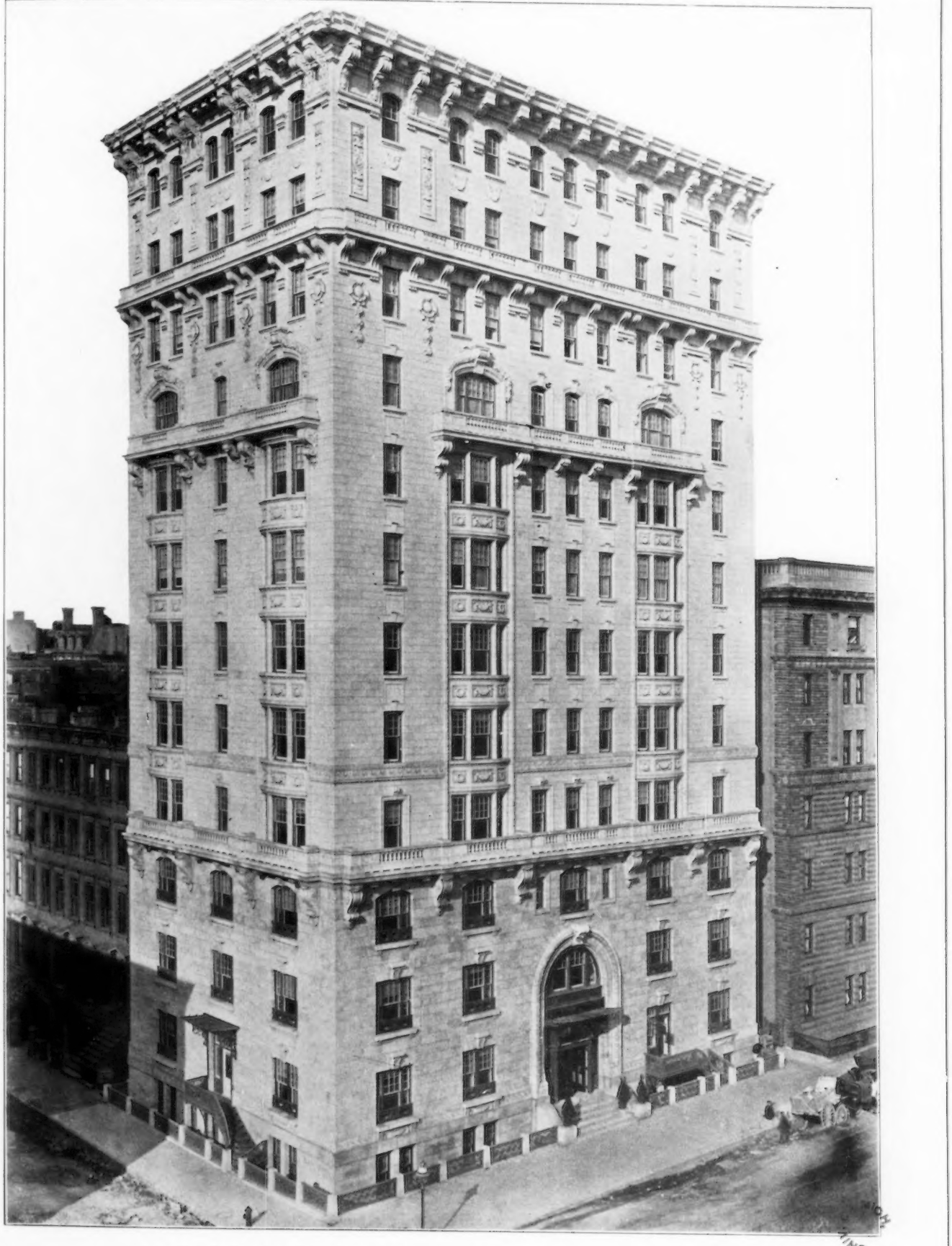




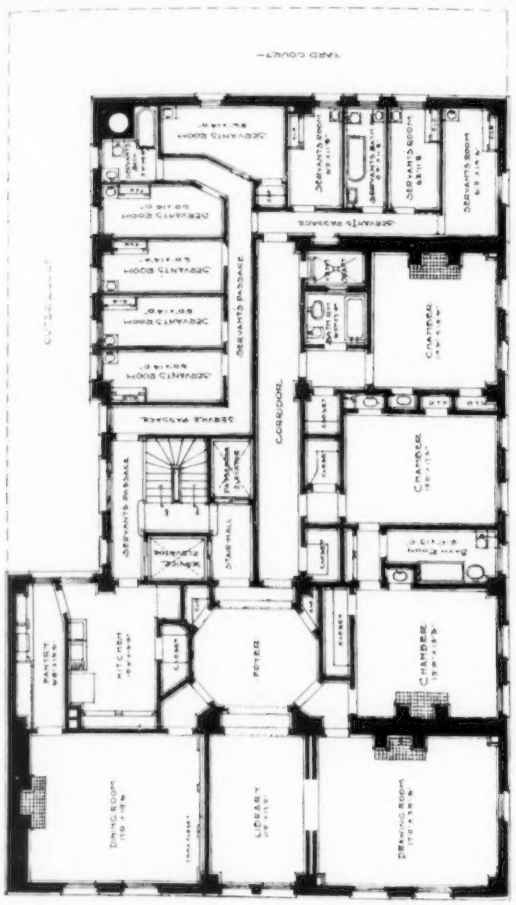


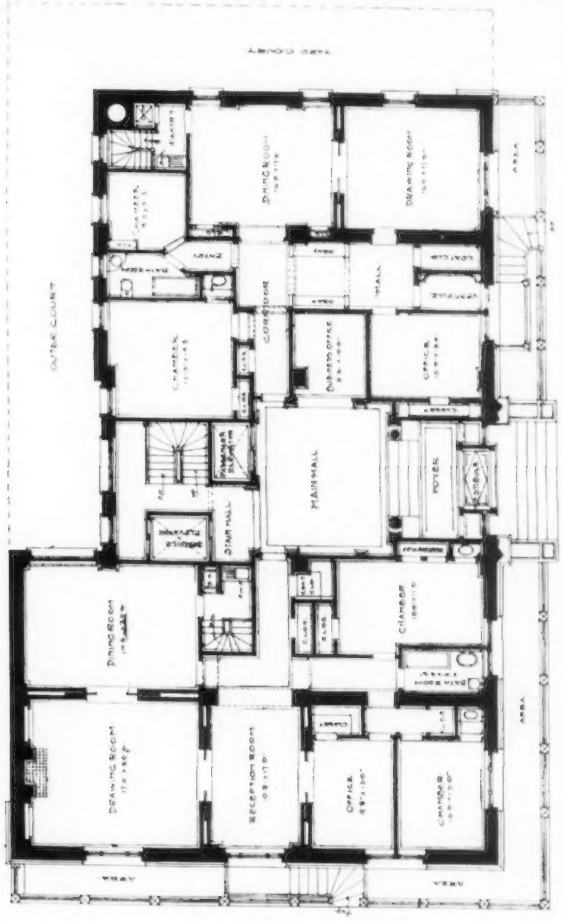


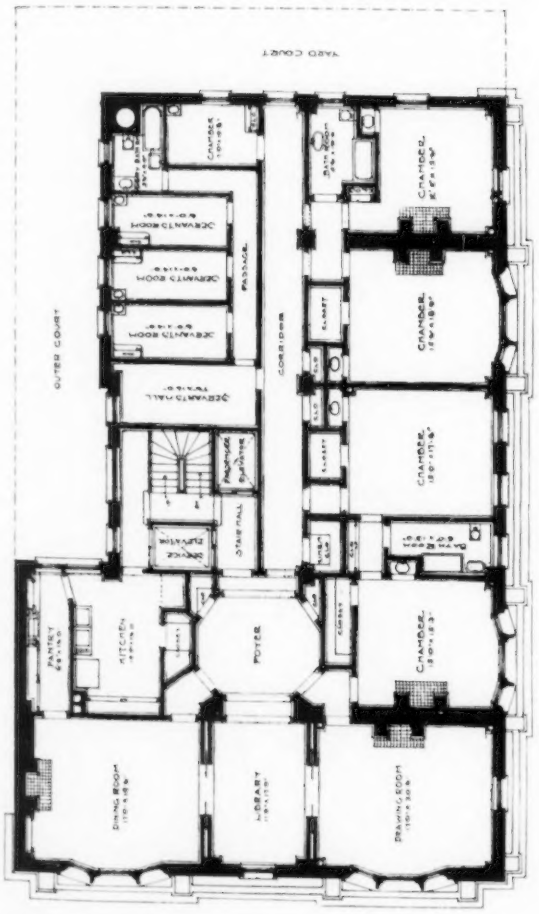


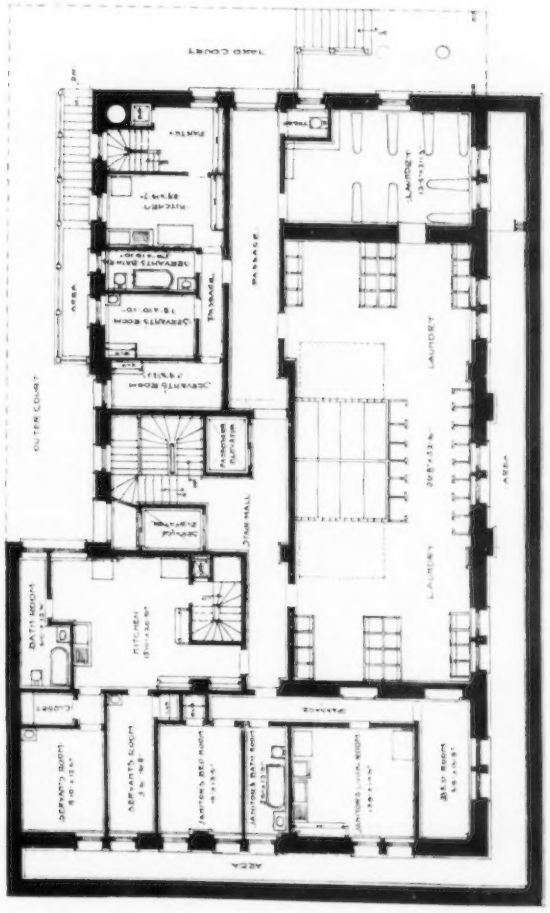


APARTMENT HOUSE, PARK AVENUE AND 61ST STREET, NEW YORK.
(ALL TERRA COTTA ABOVE THIRD STORY.)
WILLIAM A. BORING, ARCHITECT.

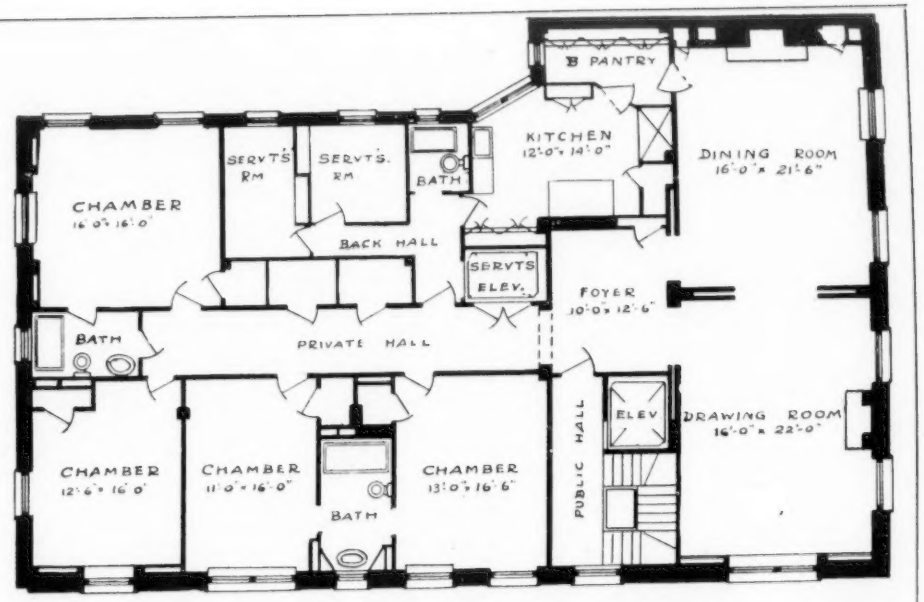




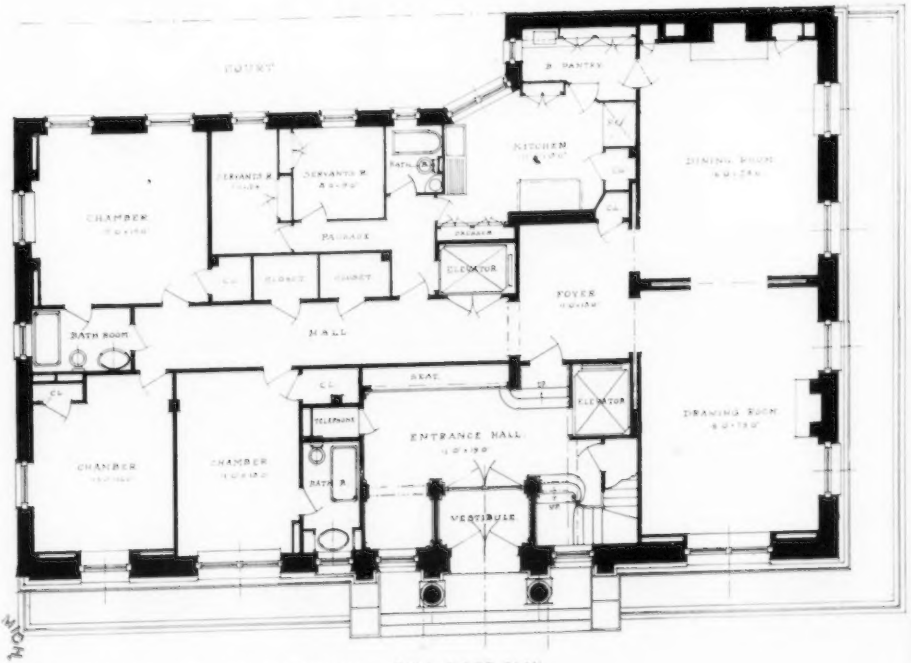




FLOOR PLANS APARTMENT HOUSE PARK AVENUE AND 61ST STREET NEW YORK



TYPICAL FLOOR PLAN



FIRST FLOOR PLAN.

APARTMENT HOUSE, MADISON AVENUE AND FIFTY-FIFTH STREET, NEW YORK.

(ONE SUITE TO EACH FLOOR.)

THAIN & THAIN, ARCHITECTS.

DETAILS OF MAIN ENTRANCE, BUILDING FOR GINN & COMPANY, PUBLISHERS, CHICAGO.
HOWARD VAN D. SHAW, ARCHITECT.

BUILDING FOR GINN & COMPANY, PUBLISHERS, CHICAGO
HOWARD VAN D. SHAW, ARCHITECT.

UNIV. OF MICH.